

The United States MILLER

Volume 10.—No. 6.

MILWAUKEE, APRIL, 1881.

Terms: \$1.00 a Year in Advance. Single Copies, 10 Cents.

Review of the Market.

[Prepared expressly for the UNITED STATES MILLER.]

April 4th 1881.—The wheat market has been stimulated considerably during the past month, by the long continued cold and stormy weather, together with rumors of more or less injury in different localities to the growing crop in the winter wheat section. Prices for May delivery, in which the principal trading has been concentrated, advanced on the 17th ult. to \$1.08½, an improvement of 6@7 cents per bushel on prices ruling towards the close of the previous month. A disposition to realize profits on previous purchases, together with the fact that purchases made for April delivery would be subject to an expense of 5½ cents per bushel for carrying into May, brought a good deal of wheat on to the market, and prices gradually receded 4@5 cents per bushel. The feeling is strengthening again somewhat, but the general impression seems to be, that there is a surplus of wheat in the country, beyond the world's requirements for the current crop year, and that it is doubtful about sustaining prices at their present moderate range, should the prospects for the coming crop, both in the winter and spring wheat sections, be ordinarily favorable. The critical period, however, is yet to come, and should the transition to spring weather develop any injury of importance to the winter wheat crop, prices must improve further. The latest advices from the spring wheat section indicate that seeding will be earlier in Minnesota and Iowa than in Wisconsin, and will commence in portions of the first-named States, in a week or ten days, but can hardly be expected to be general in this State for two or three weeks to come, with favorable weather from this time forward.

The statistical position is becoming more favorable for holders from week to week. Stocks in store at lake and seaboard ports and in transit between those points, have decreased in the past four weeks 4,335,000 bushels, and are now 8,000,000 bushels less than at the corresponding date last year. The quantity of wheat on passage for Great Britain and the Continent is reported, however, 4,696,000 bushels greater than at the corresponding date last year, which has a tendency, of course, to produce apathy in foreign markets. The export movement the past four weeks has been liberal, aggregating from Atlantic ports 8,487,000 bushels, against 4,942,000 bushels the preceding four weeks. Stocks in store at Atlantic ports are reduced to a low point, aggregating only 2,118,000 bushels, against 4,380,000 bushels at the corresponding date last year.

Receipts here are expected to be light for the coming month, much of the wheat now in country ware-houses having been sold for May delivery and will consequently be held back until that time, to save storage; and but little will be marketed in the country until seeding is over. Our advices from the country indicate that there is still a good proportion of the crop in farmers' hands, reports varying from a quarter to one-third.

We quote this market to-day steady and quiet, closing at \$1.05½ for May delivery. Dealings in cash wheat are trifling, and we quote closing prices of the leading grades as follows: No. 2 hard \$1.07; No. 2, \$1.02½; No. 3, 93; No. 4, 84.

E. P. BACON & Co.

THE WRONG LEG.—There used to be a lawyer in England who wore a cork leg so gracefully that, though everybody knew he had lost a leg, nobody knew which leg it was. He was speaking in a crowded court-room once, and behind him sat an unscrupulous young lawyer. By his side in turn sat another young lawyer, just admitted to the bar, and who had never heard of the speaker's misfortune. To him the unscrupulous young lawyer said: "You see how hot old Buxton is over his case."

Now, I'll bet you a sovereign I'll run this pin into his leg up to the head, and he'll never notice it, he's so absorbed in his case. He's a most extraordinary man in that way." The other fellow took the bet, and his companion took a large pin, and leaning forward drove it up to the head into the orator's leg. A yell that froze the blood of all who heard it, that made the hair of the jury stand on end, and caused the Judge's wig almost to fall off, ran through the court. "By Jove! It's the wrong leg, and I've lost my money," said the young lawyer, who didn't seem to care how much it hurt.

Why Nuts Work Loose.

Mr. Rose explains that the tendency of a nut to unwind and recede from the pressure upon its radial face is proportionate to the pitch of the thread and the diameter of the bolt; and the finer the thread upon a given diameter of bolt, or the larger the diameter of bolt with a given pitch of thread, the less will be the tendency of the nut to move back. In the case of ordinary bolts and nuts, a given diameter of bolt is given a standard pitch of thread, and these pitches are not so fine as to prevent the nuts from unscrewing in many cases, unless check nuts are used. It would appear that if the nut thread fits reasonably tight upon the bolt, and the nut is screwed well home, it should remain there; but there are palpable reasons why it should not do so. Of these the chief are the errors which ensue from the alteration of form which takes place in the screw-cutting tools during the hardening process. As a rule, all steel increases in dimensions from being hardened. What the amount of increase or expansion is we have at present no definite knowledge, because it varies considerably, although it is probably the same when the conditions are identical. Suppose, then, that a tap is made of the correct diameter to a vernier gauge, and that it increases in diameter and in length (as it almost invariably does) during the hardening, then the pitch, the thickness, the depth and the diameter of the thread will be altered and "out of true." Unless both the tap and the die are tempered to precisely the same shade or color, the amount of error will vary. As a result of these at present irremediable errors, taps are made to suit existing solid dies, or adjustable dies are set to suit the taps; and though the nut may fit closely to the bolt, so as to be just movable by hand, or under the moderate pressure of a wrench, yet the sides of the thread do not fit properly, nor can they be made to do so under any ordinary conditions. The result is that, under vibration, the threads give way on the contact sides; for vibration is, in effect, a number of minute blows. Under reciprocating motion the result is precisely similar; for the whole pressure upon the nut is supported by that part of the surface of the thread which is in contact, which compresses or recedes. Any machinist who desires to test this matter may do so by taking a nut that fits very tightly upon a bolt, and striking upon the sides, he will find it will lose the fit to the bolt.—Iron Manger.

The Iowa Fishway Laws.

The fishway question is again brought before the public. This time as an unconstitutional law, and Commissioner Shaw's trap won't hold water, so decided by Judge Lewis in the injunction case brought by the Harrison County Miller's Protective Association, to restrain the Board of Supervisors of the county from proceeding to attach fishways to dams erected on streams in Harrison county, as the fishlaw requires them to do when the parties owning the dams failed to put them in, in accordance with the fishlaw. S. H. Cochran, of Missouri Valley, was employed by the Association as attorney in the case. His success in the management of this and other cases wherein the constitutionality of the law was in question, indicates a legal ability of high

order, and we bespeak for him a successful future in his profession. We do not know whether the county will further test the constitutionality of the law by carrying the case to the Supreme Court, which court will have to sustain the decision of the lower court before the law is void and of no effect. If all owners of dams across streams in the State have to comply with the law, by putting in fishways, or test the constitutionality, in either case it will cost them in the aggregate a large sum of money. Should they choose the former and put in the fishways, at a low estimate it will cost \$50,000. To test the soundness of the law it will be a cost of \$25,000 or \$30,000. The cost already made and paid by the several counties of the State for models and specifications furnished by Fish Commissioner Shaw, sheriff notices, etc., amounts to a large sum of money, and the State has expended some \$50,000 in hatching, importing and planting fish in the waters of the State, which have proved to be an utter failure and a total loss to the State, as no benefits have been derived from the expenditure whatever, and there is no probability that it ever will. We have conversed with several members of the legislature in relation to the law in question, and nearly all said: "We did not think much about it; everybody seemed to be in favor of the law, therefore we voted for it." Some said they thought the law would be so obnoxious that it would lead to the repeal of the entire law relating to fish culture by the State. To enact and pass a law without thoroughly investigating its merits or demerits, or knowing it to be so obnoxious as to compel interested parties to appeal to courts that they may avoid the damage they would sustain from the enforcement of the law at a cost of tens of thousands of dollars to themselves, and a like large sum to the State, is an outrage on a free people.—Reporter, Dunlap, Harrison Co., Iowa.

Hose Pipe Nozzles.

Who is going to invent the nozzle of the future? There is no nozzle that we have ever seen that seems to us to control the stream it delivers as it should do. Instead of projecting a solid stream for a long distance, the water breaks soon after leaving the nozzle, and soon sprays and breaks up altogether. We often hear of steamers throwing 250 and 300 feet, but we recently heard a veteran chief say that he had yet to see the apparatus of any kind that would throw a solid stream 100 feet. The difficulty may be all with the water, which is naturally inclined to separate, but we are of the opinion that part of the trouble lies in the construction of the nozzle. An experiment made in Boston, by putting a core into a play pipe, and thus dividing the stream into four parts, depriving it of its rotary motion, showed a gain of 30 feet in distance playing. But even this not does seem sufficient. Our steamers give us power enough for throwing, and the hose in use gives every facility for carrying a large volume of water. There should be some means devised for delivering that volume in a solid stream at long distances. Great difficulty has been found in making nozzles operate uniformly at all times. A manufacturer of steamers once found a nozzle that gave him great satisfaction; with it his steamers could throw greater distances than any he had ever tried before. He ordered half a dozen just like it. The half a dozen were made precisely like the first, but never equaled it in delivering water. There is much to be learned yet regarding this question of delivering water on fires, and the exact relation existing between pressure, hose, play pipes, nozzles, and the friction of water.

Edw. P. Allis & Co. have contracted with Messrs. Gerlach & Co. to gut their mill entirely of its present system and introduce their thorough roller system in its place, using 16 of Gray's noiseless roller mills. The mill when complete will have a daily capacity of 250 barrels.

A Project for the Year 2000.

Lake Mackenzie is one of these "possibilities of North America" recently suggested. The lake will result from a proposed closing of the northerly outlet of the valley of the Mackenzie River, at the line 68° north, and storing up the water of 1,240,000 square miles. And to this could be added the water of other large areas. It would be a lake of about 2,000 miles in length by about 200 of average width. Its surface would have an altitude of about 650 feet above the sea level. It would cover with one continuous surface the labyrinth of streams and lakes which now occupy the Mackenzie Valley. It would be a never failing feeder for the Mississippi. It would connect with Hudson Bay and with the "great lakes," and also with the interior of Alaska by connecting with the Yukon and its affluents. By concurrent results and other "possibilities" it would become, during some months of each year, a navigable water, adding not less than 12,000 miles of communication to the Mississippi. It would complete the interior lines of river courses by connecting them. Cutting the "divide" which now exists between the Mississippi and Mackenzie would do this. This work is small when measured by its results, and it becomes easy of accomplishment under the methods proposed. The connecting of the Upper Mississippi with the proposed Lake Mackenzie would be easily made if that lake had a surface at the proposed altitude of 650 feet above the sea. The outflow from such a lake, having a length of more than 2,000 miles from south to north, and draining a very wide range of altitudes, would be a timely enduring one. This lake would make possible and easy the straightening of the Lower Mississippi. It would also contribute to the proposed ship channel from Cairo, Ill., to the Gulf of St. Lawrence, by the almost straight line which cuts the Wabash Valley, the Lakes Erie and Ontario, and the Lower St. Lawrence. This commercial channel, receiving all the waters converging at Cairo, would complete the demand for a constantly open ship channel from the St. Lawrence to the sea by way of the Strait of Belle Isle. That demand can be complied with, and the shortest and best line of communication can be thus opened between the interior and the seaboard.—St. Louis Republican.

THE THEORY OF THE BESSEMER PROCESS.

There is nothing like knowing the reason for things. A writer thus explains the theory of the decarbonization of iron in the Bessemer converter: Some inquisitive reader may be desirous of knowing "why there should be this effect of the air-blast through the melted cast iron." Webster says that "it burns out a portion of the carbon." We say that the air, forced through the molten metal, blows out its impurities. The changed appearance of the flame from a dead red to a clear white light indicates this fact. Says another: "Why add spiegeleisen?" After forcing the air through the liquid iron it becomes more or less porous. The spiegeleisen contains a large per cent of manganese. This attracts, gives density, cohesion and tensile strength to the compound. Some illustrate the change by the formation of a seedling powder. In this the parts separated are an acid and an alkali. Combined it is a new liquid—differing entirely from its component parts. Now, it cleanses and purifies the stomach. So the cast iron, freed from its impurities, and in a fluid condition, the spiegeleisen, highly charged with manganese, and also in a fluid state, immediately unites all its properties with the iron, and the result is a fine quality of steel, possessing great hardness and sufficient tensile strength for the best kind of steel for railroads.

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UNITED STATES MILLER.

PUBLISHED MONTHLY.
Office, 62 GRAND OPERA HOUSE, MILWAUKEE, WIS.
Subscription Price.....\$1 per year in advance
Foreign Subscription.....\$1.50 per year in advance

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MILWAUKEE, APRIL, 1881.

We send out monthly a large number of sample copies of THE UNITED STATES MILLER to millers who are not subscribers. We wish them to consider the receipt of a sample copy as a cordial invitation to them to become regular subscribers. Send us One Dollar in money or stamps, and we will send THE MILLER to you for one year.

MILLERS' DIRECTORY.

All mill-furnishers, flour brokers or other parties desiring to reach the flour mill owners and millwrights of the United States and Canada, should have a copy of the above named work. It contains about 15,000 names with Post-office addresses, and in many cases (notably in Wisconsin and Minnesota) gives the number of runs of stone, sets of rollers, and kind of power used, or the capacity in barrels. A limited number of copies only have been printed. Upwards of 100 of the leading mill-furnishing houses and flour brokers in this country and several in Europe have already secured copies. Send in your orders at once. Price Five Dollars, on receipt of which Directory will be forwarded post-paid by mail. Address, UNITED STATES MILLER, MILWAUKEE, WIS.

The United States Consuls in various parts of the world who receive this paper, will please oblige the publishers and manufacturers advertising therein, by placing it in their offices where it can be seen by those parties seeking such information as it may contain. We shall be highly gratified to receive communications for publication from Consuls or Consular Agents everywhere, and we believe that such letters will be read with interest, and will be highly appreciated.

We respectfully request our readers when they write to persons or firms advertising in this paper, to mention that their advertisement was seen in the UNITED STATES MILLER. You will thereby oblige not only this paper, but the advertisers.

DEALERS in milling supplies of all kinds should advertise in the UNITED STATES MILLER.

THE vigorous language of the late Zach. Chandler, as he applied it to the South, might well be used now in regard to Russia. He advised the South "to raise more corn and less hell." The South has taken the advice and is yearly increasing in prosperity. May we hope that Russia will also take the advice before another Czar is butchered.

The Wheat Meal Purifier.

We desire to call the attention of our readers to the advertisement of the Wheat Meal Purifier Co. of Minneapolis, Minn. and Georgetown, D. C. on another page. The system and machine introduced by this company is said to have given the most favorable results wherever it has been introduced. In these days of improvement and competition and the strife to increase our flour export trade, it behooves all millers to investigate the claims of all valuable inventions tending to increase the yield and quality of flour from a bushel of wheat. The system and machinery of the Wheat Meal Purifier Co. has been in use for a considerable length of time and the many testimonials given from millers in high standing must be gratifying to the Company. We would earnestly recommend our readers to write to them for full particulars.

The Mississippi Grain Trade.

Few of our readers are aware of the extent to which the transportation of grain from St. Louis to New Orleans for shipment to Europe has grown. One steamer will take

in tow a line of barges nearly a half a mile in length all loaded with grain—One fleet of barges recently were towed from St. Louis carrying 10,000 tons of grain for reshipment at New Orleans to Europe. In 1870 these shipments were only 66,000 bushels and in 1880 increased to 15,717,664 bushels and the prospects are that the present year will see these shipments doubled providing there is a good crop in the district contributing to the river trade. It has been determined to extend this system of barge transportation to Davenport, Iowa. This will perhaps interfere to some extent with the shipment of grain from Iowa to Chicago but it remains to be seen which route offers the best advantages for the least money.

The Lake Marine.

The importance of navigation on the great chain of lakes is yearly increasing as the demands for it increase. A few years since a craft with a capacity of 600 tons was considered a large one but now there are crafts on the lakes having a capacity of 2,800 tons. A propeller will be launched shortly at Toledo that will be able to carry 140,000 bushels of grain. During the period of time when navigation is open by lake from Chicago and Milwaukee to Buffalo and thence to New York by canal and river, freights are far below what they are when navigation is closed and the railroad lines to the Atlantic seaboard have things their own way. As a natural consequence freights from the West are rushed through before navigation closes and after that there is a great falling off in shipments until it opens again unless prices advance to such a degree as to pay the difference in freight. Iron steamships will soon be put on the lakes and if the harvests should be good for a few years our lake marine will be one of the most important features of transportation in this country. It is not at all improbable that with the completion of the canal improvements in Canada, we shall see foreign vessels of large tonnage at our own docks unloading and loading their cargoes.

Engine Tests at the Cincinnati Exhibition.

The report of the tests of automatic cut-off engines at the late millers' international exhibition held some nine months ago is at last made public. The report does great credit to the art preservative and the person who superintended its make-up. The results are summarized in a manner which will not leave anyone desirous of purchasing any of the three makes tested in doubt as to the fine and weak points of each. There can be but one opinion regarding the fairness and impartiality of this report. The report shows conclusively that so far as the excellence of workmanship and economy of performance is concerned there is but little difference, and that each is alike creditable to designer and builder. A summary of the report may be of interest to our readers: Three engines were tested, viz.: the Reynolds-Corliss, made by Messrs. E. P. Allis & Co., Milwaukee, Wis.; the Harris-Corliss, built by W. A. Harris, Providence, R. I.; and the Wheelock, built by Jerome Wheelock, Worcester, Mass. The two first named are well known to the Western trade, and the third will undoubtedly be better known in the future. The Brown and the Buckeye were also entered for trial, but were withdrawn, the Brown on account of its condenser and the Buckeye because the foundation was defective.

As condensing engines, in useful effect the Wheelock stood first, the Reynolds-Corliss second, and the Harris-Corliss third, the relative record being: Wheelock, .908845; Reynolds - Corliss, .878518; Harris - Corliss, .876183. When tested non-condensing, the Wheelock stood first, the Harris-Corliss second, and the Reynolds-Corliss third, the record being: Wheelock, .905253; Harris - Corliss, .891653; and Reynolds-Corliss, .886094. Upon economy alone the record was: Harris-Corliss, .99743; Reynolds-Corliss, .96497; and Wheelock, .94238.

The record for economy and regularity of motion combined, was: Harris-Corliss, .99416; Reynolds-Corliss, .96998; Wheelock, .96032.

In the trial as to regularity of motion under varying loads and steam pressure, the Reynolds-Corliss was first, with a variation of only .0039; Wheelock, .3864; Harris-Corliss, 1.263; the relative position as regards regularity of motion being: Reynolds - Corliss, 1.0000; Wheelock, .9962; Harris-Corliss, .9876.

The report shows that not one of the engines tested can claim to be first in all the points which go to make up the sum total of excellence, while each of them has that of which

its makers may well be proud. In fact, the result of the test was so close that the expert begins his report by saying that upon the record, which was as close as skill and vigilance could make it, it appears that while one engine develops the highest economy condensing, another develops the highest economy non-condensing, while the third has a regulation under a varying load hitherto unheard of, and closes the same report by saying that, in view of the near approximation of the engines in point of steam economy and the probability of error in the meter record of condensing water, he would submit the report without making any award.

Whether the conditions under which the tests were made were such as will best indicate the performance of the engines tested in actual use is open to question. There is no doubt that the test revealed to each maker some point wherein his engine might be improved, and if another trial were made it would be seen that each maker had profited by the tests of last June and that to-day a test trial would reveal the fact that of the three engines it would be hard to decide which was the best one, taking all points into consideration, to use for any particular purpose.

Electricity in Flour Mills.

THE ELECTRIC PURIFIER A SUCCESS.

It is now nearly a year since the announcement was made that Mr. Thos. B. Osborn, of New Haven, Ct., had been successful in applying electricity for the purpose of purifying middlings. A great deal of surprise and interest was manifested by millers throughout this country. Since that time great attention has been paid to perfecting the machine, and now the electric purifier has been brought to such a state of perfection that a company with a capital of \$300,000 has been organized in New York City for the purpose of manufacturing and introducing this wonderful and valuable machine. Mr. John Rice of 17 Monroe St., New York, formerly a well known druggist in Milwaukee, is the General Manager of the company. The process of purification is very simple. The unpurified middlings are passed into a hopper and distributed over bolting cloth sieves of different numbers. These sieves are agitated, and the bran and light particles are brought to the surface. Revolving hard rubber rollers electrified by contact with a sheep-skin cushion attract the bran to them, while the flour and middlings of different degrees of fineness drop through the sieves, and the bran is conveyed off to a proper receptacle. These purifiers require but little power to run them, and occupy very little space, and are entirely free from dust. Several of these purifiers have been in operation in the Atlantic Flour Mills in South Brooklyn, N. Y., for months, and have performed their duty to the entire satisfaction of the mill-owners. The proprietors, Messrs. F. E. & H. E. Smith, in writing to the inventor say "we have very carefully tested the saving it effects as compared with the best air purifiers in use, and find the difference in its favor to be six or eight per cent. The Electric Purifier will be on exhibition in May, in London, England, at the Millers Exhibition. Mr. Rice informs us that he has already taken a number of orders, and thinks the time is not far distant when the use of electricity will be the only means used for the purifications of middlings.

Immigration, February, 1881.

The Chief of the Bureau of Statistics furnish the following information in regard to immigration into the United States.

There arrived in the ports of Baltimore, Boston, Detroit, Eastport, New Bedford, New Orleans, New York, Philadelphia, Port Huron, and San Francisco, during the month ended February 28, 1881, 17,166 passengers, of whom 15,975 were immigrants, 1,482 citizens of the United States returned from abroad, and 609 aliens not intending to remain in the United States.

Of the total number of immigrants, there arrived from England and Wales, 1,984; Scotland, 492; Ireland, 896; Germany, 5,292; Austria, 324; Sweden, 169; Norway, 39; Denmark, 99; France, 214; Switzerland, 423; Netherlands, 1; Italy, 971; Russia, 94; Poland, 93; Hungary, 856; Dominion of Canada, 2,879; China, 804; Australia, 105; and from all other countries, 320.

The number of immigrants arrived at the above named ports during the eight (8) months ended February 28, 1881, was as follows;

From Germany, 82,699; Dominion of Canada, 77,218; England and Wales, 82,976; Ireland, 86,161; Scotland, 3,078; China, 3,571; all other countries, 67,073.

A Short History of Wheat.

The varieties of wheat are numberless and their characters vary widely under the influence of cultivation and climate. There are said to be 180 distinct varieties in the Museum of Cornell University. On the slopes of the mountains of Mexico and Xalapa the luxuriance of vegetation is such that wheat does not form ears. In Japan, it is said the wheat has been so developed by the Japanese farmers that no matter how much manure is used, the straw will not grow larger, though the length of the ears increases. The height is rarely more than two feet, and often no more than twenty inches. Through selection winter wheat has been changed to summer wheat in three years, and summer wheat converted in the same time to winter wheat. In general, wheat is the most esteemed of the cereal productions, but in Abyssinia, according to Parkyns, the flour of the "teff" or "dugassa," scarcely palatable to Europeans, is preferred by the natives to any other grain.

Isis was supposed to have introduced wheat into Egypt, Demeter into Greece, and the Emperor Chin Wong into China, about 3,000 B. C. In Europe it was cultivated before the period of history, as samples have been recovered from the lacustrine dwellings of Switzerland. In England it was probably not cultivated by the ancient Britons, but the Anglo-Saxons, when Bede wrote, early in the 8th century, sowed their wheat in the spring, and in the days of Queen Elizabeth its cultivation was but partial. Indeed wheat was an article of comparative luxury till nearly the 17th century. In India wheat seems not to be native, but introducers of its Sanscrit name signifies "food of the barbarian;" yet three varieties are mentioned in the Bhavaprakasa, one of which, a large grained, is said to have come from the West, and another, a small-grained or beardless wheat, is said to have been indigenous to Middle India.

The first wheat raised in the "New World" was sown by Spaniards on the Island of Isabella, in January, 1494, and on March 30 the ears were gathered. The foundation of the wheat harvest of Mexico is said to have been three or four grains carefully cultivated in 1530, and preserved by a slave of Cortez. The crop of Quito was raised by a Franciscan monk in front of the convent. Garcilasso de la Nerga affirms that in Peru, up to 1547, wheaten bread had not been sold at Cosco. Wheat was first sown by Gosnold on Cuttyhunk, one of the Elizabeth Islands in Buzzard's Bay, off Massachusetts, in 1602, when he first explored the coast. In 1604, on the Island of St. Croix, near Calias, Me., the Sieur de Monts had some wheat sown, which flourished finely. In 1611 the first wheat appears to have been sown in Virginia. In 1626 samples of wheat grown in the Dutch colony at New Netherlands were shown in Holland. It is probable that wheat was sown in the Plymouth colony prior to 1429, though we find no record of it, and in 1629 wheat was ordered from England to be used as seed. In 1718 wheat was introduced into the Valley of the Mississippi by the "Western Company." In 1799 it was among the cultivated crops of Simos Indians of the Gila River, New Mexico.

What Varieties of Wheat to Sow.

We trust now that seed time is so near at hand that the farmers of the North West will not fail to heed the recommendations of the millers at their convention in Ohio last season in regard to the varieties of wheat they should sow. It is important to their interests that they observe their wishes in this particular, especially when these varieties yield so well and are so profitable to the farmer. The following is a list of their recommendations: First, Minnesota five, hard and glutinous, yielding largely in "middlings" for "purification" and manufacture into patent flour; Rio Grande, China or Mopmouth, with a large and heavy berry adapted to weak lands, as it has a rank growth of straw, and the Cass Club, a soft wheat, which makes a first rate family flour, not remarkable for strength. The Lost Nation or Prussian Fife, that is produced extensively in Wisconsin, Iowa and Minnesota, and which always yields a bountiful crop, was declared to be the least desirable variety grown for milling purposes, being soft, weak and poor in color.

Allis & Co. have been successful in their proposition to the Joliet Steel Works for a pair of blowing engines, size 36x54 and 76x54. Their bid for these engines was \$82,000, and \$10,500 more than their competing firm, but the superiority of the Reynolds engine satisfied the proprietors in regard to the difference in figures.

Explosion of the Boiler at Cambridge, Mass., April, 1878.

It was a horizontal tubular, one of the most common in use, and well known to all familiar with steam boilers. It was made for the present owners in November, 1869; was 48 inches diameter and 17 feet long. All longitudinal seams double-riveted, with the necessary man-hole on top for getting into the boiler for inspection and cleaning it out. Hand-hole in bottom of front head for clean-

by frequent overheating for considerable distance along the bottom, and the usual working pressure was sufficient to rend it and allow of the instantaneous escape of the steam, which, owing to its activity, would pass through the mass of water, driving a portion before it, and enlarging the initial opening, as shown in Fig. 6, and an instant may be

manhood, but when the overheating had so reduced the strength of the plate at A, which has to sustain just double the strain per ring unit, see A B, Fig. A, that it does per stove unit E F, Fig. A, there would seem to be little doubt in the minds of practical men where the fracture started, even though statistics did not, as they certainly do, clearly show that

confirm the theory above offered, and shows the difference in destructive effect between a full supply of water (in the boiler at the time of the explosion), and little or none at all.

The boiler was of precisely similar construction, shown in Fig. 8, and at the time of the explosion contained no water at all. It was in communication with two adjoining boilers of the same system by means of the steam pipe, and it was ruptured by dry steam while its bottom over the fire was red hot. It will be seen that the rupture is similar to that

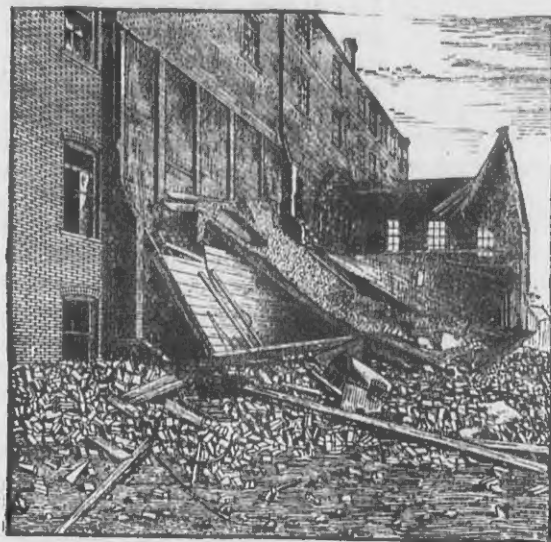


FIG. 1—WRECK OF THE BOILER-HOUSE.

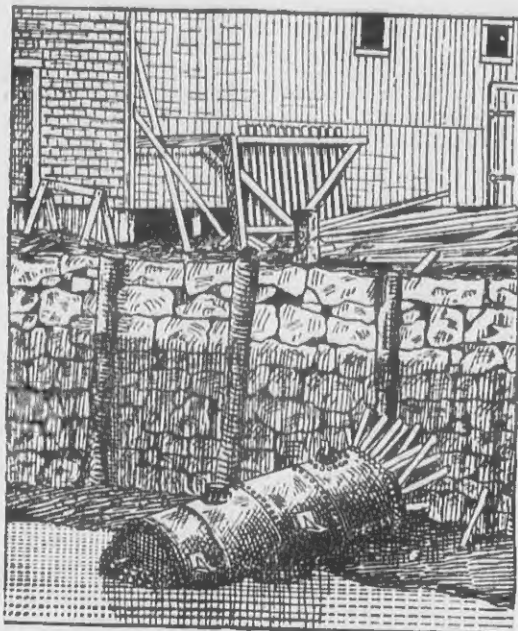


FIG. 2—THE PRINCIPAL PART OF THE BOILER-HOUSE IN THE CANAL AT LOW TIDE.

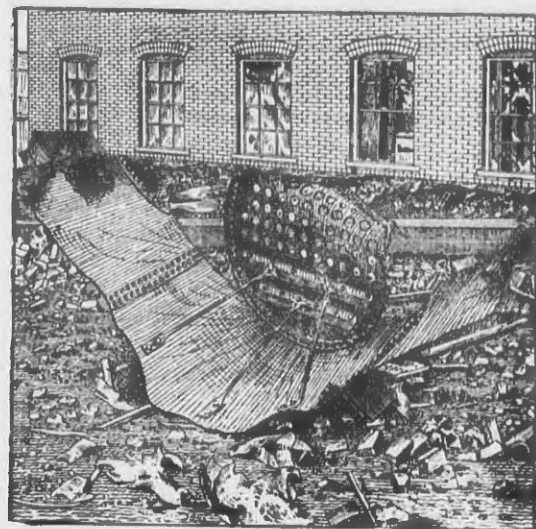


FIG. 3—THE REAR END OF THE BOILER.

ing out under the tubes. The shell of the boiler was of best quality C No. 1 iron, 5-16 thick. The heads were best quality flange iron, 3/4 inch thick, being well braced, having angle-iron braces riveted to the heads, and stays from thence to the shell. It was furnished with the usual appliances: one safety valve 3 inch diameter, three gauge cocks, etc., and at its completion was examined and subjected to a hydraulic pressure of 150 pounds per square inch, and considered safe at a steam pressure not exceeding 100 pounds per square inch.

The above description is quoted from the report of Inspector Fairbairn of the Eastern Department.

Of the following illustrations Figures 1, 2 and 3 represent the wreck of the boiler and building. They are copies of photographs taken soon after the explosion. The cuts that follow are intended to illustrate the theory of the explosion.

Cut No. 4 is a longitudinal section of the boiler as originally made, omitting the patches which have been put on since, but showing at A the location of the deposit which permitted the iron beneath it to become overheated.

The explosion of this boiler occurred in April, 1878, by which three persons were killed, and a number more wounded. An unusual interest was excited by this accident, and a number of experts called to testify as to the cause of the disaster, and although there was no disagreement among trained boiler inspectors, still there was doubt expressed by one expert witness as to the original soundness of the iron, and the correctness of the construction and setting. The marks upon the plates of the back part of the boiler seemed, from the evidence, to plainly indicate a considerable deposit A (Fig. 4), and repeated repairs of the bottom of the shell has been made, all rendered necessary from overheating where sediment had prevented contact of the water with the iron. Whatever the character of the iron and the faults of construction may have been, there would seem to have been sufficient warning of approaching disaster to have prompted a greater degree of care in inspection and cleaning.

The boiler was worked at a pressure of about 75 lbs. per square inch, and it was allowed to come to repairs repeatedly without any inspection, till at last, on the 6th of April, it exploded with destructive force, the larger portion, consisting of about 4-5 of the shell, and containing all the tubes, was projected through the side of the building a distance of 150 or 200 feet into a canal, where at low water it was photographed (Fig. 2).

The initial rupture was undoubtedly at A (Figs. 4 and 5), the iron having been weakened

conceived in which the water is disintegrated and expanded with such suddenness as to give the character of an explosion; it fills the entire steam-room and water-room, and is projected like a charge from a cannon against the rear head of the boiler, there being little resistance in that direction. The parallel surfaces of the shell and tubes direct the mass of foamy water, which still retains a large percentage of its original specific gravity, and its inertia or momentum carries enough of it past the opening to tear the boiler apart, as shown in Fig. 7, and the principal part takes a rocket-like course, a distance which is determined by the quantity of expanding elements that it contains and the freedom with which it can

initial ruptures in shells of this form almost invariably are longitudinal.

The bracing, which was charged by the same witnesses with contributing to the weakness, is not placed in the boiler for the purpose of supporting the cylinder part, but to prevent the bulging out of the flat end-plates or heads,

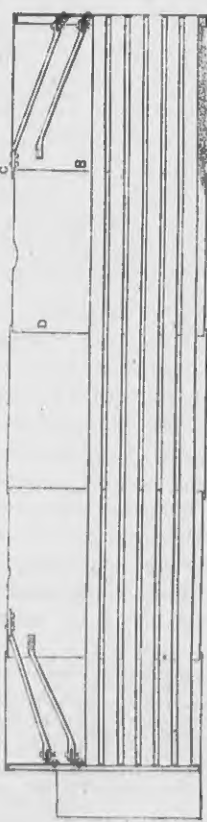


FIG. 4.

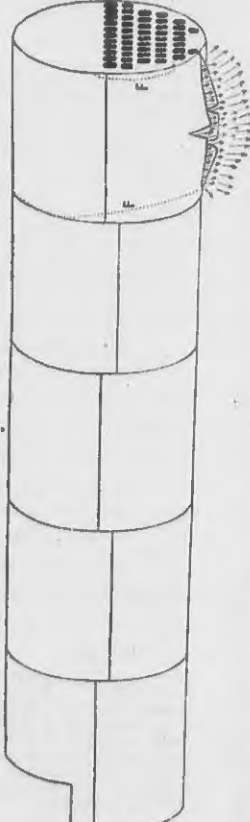


FIG. 5.

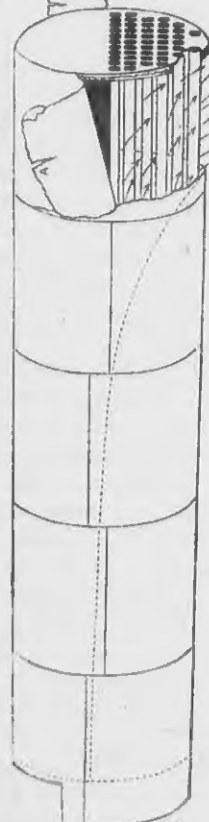


FIG. 6.

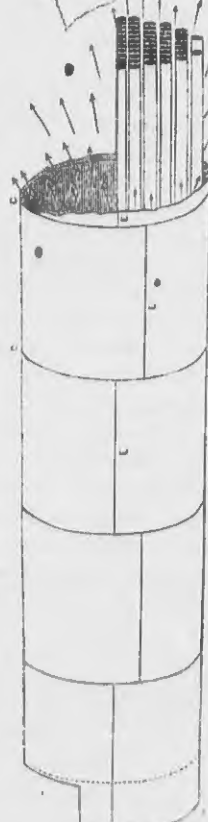


FIG. 7.

escape. The process is practically continuous, but eye-witnesses often, at coroners' inquests, have said they heard a great rush of steam followed by a loud explosion.

In this case a doubt was expressed by some of the witnesses as to the probable location of the initial rupture, but none of the practical boiler inspectors who were called expressed the least doubt as to the presence of a considerable deposit at A (Fig. 4). The weakest point, originally, may have been the seam C B, as stated by one expert, owing to faulty work-

and they are not used nor needed on heads that are sufficiently stiff to bear the load without bulging, as are ribbed, heavy cast-iron or hemispherical wrought-iron heads, in plain cylindrical boilers without tubes, then the seam C B, Figs. 4 and 7, would be called on to sustain the entire load on the area of the rear head, and even this is but half what is put upon the seams E E, etc., per lineal unit of seam measurement—not per square inch.

An explosion occurred in the same inspection district in September, 1875, which tends to

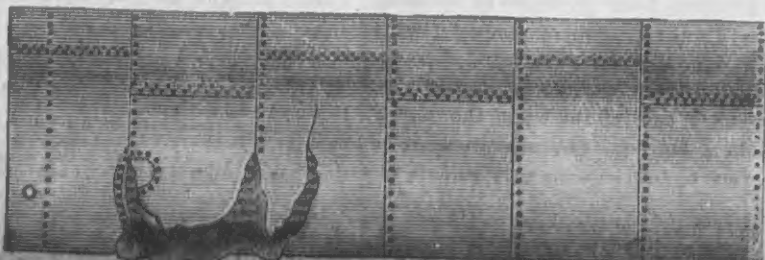
supposed to be the initial rupture in this case and had the boiler, Fig. 5, contained no water, the damage would have stopped, as it did, here.

The boiler, Fig. 8, did not leave its setting, and no lives were lost, but the fireman was driven to the wall of the boiler room. It dropped on the bridge wall, the fire front, which supported the front end, having been thrown down by the first gush of steam.

We are indebted to the Hartford Steam Boiler Inspection and Insurance Co., of Hartford, Ct., for the illustrations.

ELECTRICITY IN THE WRONG PLACE.—The Albany Journal records an incident that exhibits this good servant in the character of a bad master. In one corner of Weed, Parsons & Co.'s printing establishment stands the machine that furnishes the electric light for an adjacent store, the power coming from the engine of Weed, Parsons & Co. One feature of the machine is the armature, a wheel containing coils of insulated wire through which the electricity flows in powerful currents when the apparatus is in operation. This armature revolves with terrific velocity, and constitutes a powerful magnet. On the day mentioned, a young man came in and ground a pair of scissors at an emery wheel near the generator. Turning to go out past the machine, he carried the scissors carelessly in his hand, when they were immediately drawn into the armature, and were soon revolving with it at frightful speed. The young man got out of the way as quickly as possible and was unhurt. For a few minutes, the machine presented a very startling spectacle. The whirling scissors, twisted and broken, but still adhering to the revolving armature, began to cut the wires, and thus broke the electric current, which escaped in streams from the fractured ends of the wires, and in a moment or two that portion of the room was literally filled to the ceiling with whirling lightning. No one dared to approach the machinery for some little time, but the belt was finally thrown off, and the dangerous show was at an end.

READY TO GO.—"Bress de Lord!" fervently exclaimed an old Florida woman, raising her hands in amazement, as she saw a handsomely dressed lady driving a drag, with a colored boy on the footman's seat behind, in a Jacksonville street—"Bress de Lord! I never 'spected to see dat. Wonder what dat young cullud gemman [pays dat ar young white 'oman for driving der kerridge? I know'd it'd come, but neber 'spected to lib to see it. Dis nigga's ready to go way now."



UNITED STATES MILLER.

E. HARRISON CAWKER, EDITOR.

PUBLISHED MONTHLY.

OFFICE, 62 GRAND OPERA HOUSE, MILWAUKEE, WIS.
 SUBSCRIPTION PRICE.—PER YEAR, IN ADVANCE.
 To American subscribers, postage prepaid..... \$1 00
 To Canadian subscribers, postage prepaid..... 1 00
 Foreign Subscriptions..... 1 50
 All Drafts and Post-Office Money Orders must be made payable to E. Harrison Cawker.
 Bills for advertising will be sent monthly unless otherwise agreed upon.
 For estimates for advertising address the United States Miller.

(Entered at the Post Office at Milwaukee, Wis., a second-class matter.)

MILWAUKEE, APRIL, 1881.

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Five Years Old.

This number completes the fifth year of the publication of the UNITED STATES MILLER. We have labored unceasingly for the benefit of our readers, and, judging by the patronage we have received and the many kind letters sent to us, we believe we have given pretty general satisfaction. It is probable that the paper will be increased in size before the close of the present year. Our May number will be a good one to commence with for new subscribers.

Wisconsin Millers' Association.

OFFICIAL CALL FOR ANNUAL MEETING.

OFFICE WISCONSIN STATE MILLERS' ASS'N, }
 MILWAUKEE, April 4, 1881. }

The annual meeting of the above association will be held at the parlors of the Newhall House, in this city, Tuesday, April 12th, at 2 o'clock p. m. A full attendance desired, as business of importance will come before the meeting. There will also be an election of officers for the ensuing year.

S. H. SEAMANS, Sec'y.

THE MINNESOTA MILLERS' ASSOCIATION will hold its regular annual meeting at the Nicolet House, Minneapolis, Minn., at 10.30 A. M. April 12th, 1881. A full attendance is earnestly requested.

LEFFEL'S MECHANICAL NEWS for March, comes out in a very handsome shape. The paper has been enlarged and will in the future be still more valuable to its readers than in the past. We wish the News unlimited prosperity.

DURING the month of February 7,650,182 bushels of wheat and 554,799 barrels of wheat flour were exported. The total value of bread-stuffs exported for the eight months ending February, 1881, were \$182,428,826 against \$188,835,659 during the same period in 1880.

A NEW INVENTION.—Mr. D. L. Weaver, of Hesperia, Mich., has recently invented a mid-dings purifier which is said to have many new and valuable features. He has sent us a sketch of the machine, from which we conclude that the machine will do good work. We shall probably have the pleasure of giving our readers an illustrated description of it.

THE GROUND HOG WAS RIGHT.—The second day of February is known amongst the hunters and trappers of this country as ground-hog day. On this day it is said the ground-

hog or wood-chuck awakens from his winter's sleep and cautiously comes out of his hole in the ground, between 12 o'clock at noon and 1 p. m. If the sun shines so that he can see his shadow, he concludes that the winter will last six weeks longer and crawls back to his nest and goes to sleep again for six weeks. The 2d of February this year was cloudy during the whole day with the exception of about 15 minutes between noon and one o'clock. The ground-hog undoubtedly saw his shadow and wisely retired to his nest for another long nap for we have had a continuous succession of cold and stormy weather ever since and the first of April finds the thermometer standing at 18° above zero. Our winter has been the longest and severest of any within the memory of the living in this latitude.

Crooked Inspection.

Charges having been made that certain inspectors of grain in Milwaukee had been bribed by interested parties to grade grain higher than it should be, the Board of Directors of the Milwaukee Chamber of Commerce proceeded at once to investigate the matter. One inspector was found guilty of having accepted a bribe upon his own confession but stated that he had returned the amount to the donor and had never inspected any of their grain since. It was not proved that he had in any case made a false inspection. It seems however to be believed that some members of the Board of Trade and inspectors have connived to a certain extent to obtain favorable inspection and higher grades than they were entitled to. The inspector found guilty was suspended for one year. After this investigation which is not yet entirely concluded it is believed that it will be a long time before any further "crookedness" will be perpetrated. Milwaukee grades of wheat have always had an excellent reputation at home and abroad and it is of the highest importance to sustain that reputation. Crooked inspectors and crooked members should be promptly kicked out that the reputation of our grades of grain may stand well in the world and that the reputation of the Milwaukee Chamber of Commerce as an honorable body of men may remain untarnished.

Sailing under False Colors.

The Nashville, (Tenn.) American recently contained the following communication from their regular correspondent:

SHELBYVILLE, TENN., March 24th, 1881.—Two men claiming to represent the Richmond City Mill Works, of Richmond, Indiana, appeared in town Monday. They called on Lipscomb & Co., proprietors of Victor Flouring Mills, and proposed to furnish them a newly patented burr dress, which would greatly increase the yield of flour. It seems that some time during the day a member of the firm found in the American Miller, for February, an article exposing two men, whose operations answered to these individuals. The article was shown them, but they said the persons there described were different men altogether. They were then asked to telegraph to Richmond City Mill Works for credentials, but refused to do so, saying that they possessed papers which would satisfy anyone of their honor and integrity. The papers were forthcoming, which created a difference of opinion among the members of the firm. The men left Tuesday. Wednesday Lipscomb & Co. telegraphed to Richmond City Mill Works to know if such men were connected with them. "No," was the answer. The elder of the two men gives his name as J. O. Kepler, and styles his firm J. O. Kepler & Co.

Things Worth Knowing.

A good clock oil is made as follows: Take olive oil and dissolve it in boiling alcohol, and add it drop by drop until it is no longer taken into solution. Upon cooling it will let fall crystals, and leave a considerable portion still fluid. The fluid part is to be poured off, filtered through a piece of white blotting paper, and may be used in this form, or the alcohol may be distilled off for fresh processes, and the pure lubricating oil which remains is very suitable for oiling watches, clocks, or other delicate machinery. This will not oxidize or gum up, even when exposed to great cold. Or take neatfoot oil and drop it into some lead or shavings in order to neutralize the acid contained in the oil. Let this stand for a considerable time (the longer the better). Oil thus prepared never corrodes or thickens.

SOREL'S CEMENT.—Mix commercial zinc white with one-half its bulk of fine sand, adding a solution of chloride of zinc of 1.26 specific gravity, and rub the whole thoroughly together in a mortar. The mixture must be applied at once, as it hardens very quickly.

B. H. EVERS.

Just after our March number was issued we were visited by P. G. Monroe, Esq., the Chicago representative of the Millers' Journal of New York, who introduced to us B. H. Evers as a member of the firm of Phillips, Marshall & Co., of 79 Mark Lane, London, England, said firm being represented to us as a well established and wealthy firm of flour merchants. Mr. Evers said he had never been in the United States before, and had visited this country for the purpose of soliciting consignments of American spring wheat flour. He exhibited to us, letters of credit for many thousands of pounds and had every appearance of being an energetic, shrewd business man. Endorsed so thoroughly we did not hesitate to introduce him to several millers and flour brokers in this city. By chance, one evening, Mr. A. Syme, a well-known and wealthy miller of Menasha, Wis., happened to see Mr. Evers at the Plankinton House, and claimed that he recognized him at once as Edward Evers, formerly of St. Louis, who was sentenced to the penitentiary for two years several years ago for obtaining money under false pretences. He did not speak to him and he did not see him again that night. The next day Mr. Seamans, the Secretary of the Millers' National Association and member of the firm of S. H. Seamans & Co., of the Empire Mills, had been negotiating with Mr. Evers concerning some flour, and mentioning the fact to Mr. Syme whom he met, Mr. Syme at once told him that he knew the man and that he was the St. Louis Edward Evers and not B. H. Evers as represented, and came with Mr. Seamans to the office of the UNITED STATES MILLER and hailed him as Edward Evers, formerly of St. Louis. Mr. Evers did not appear to recognize Mr. Symes and declared he had never been in this country in his life until about three weeks previous. Of course negotiations were broken off at this point and the question of identity was now to be settled. Mr. Syme went to Chicago. So did Evers. Mr. Syme visited the Times office, and the next morning the following notice appeared in the Times of March 7.

A Syme, a prominent miller of Menasha, Wis., called at the Times office and furnished a reporter with an account of some recent experience which he had in Milwaukee. A few days ago, at the Plankinton house in that city, he recognized in the person of a self-styled gentleman from London, Edw. Evers, a rather notorious swindler, who operated extensively in St. Louis about ten years ago. Evers was then a member of a clique composed of Dunstan, Baldwin and Evers, and his connection with a certain co-operation scheme eventually put him behind the bars. On being released he disappeared, and his former haunts knew him no more. He turned up in Milwaukee last week, representing himself to be an agent of the London firm of Phillips, Marshall & Co., and negotiating with different millers for large shipments of flour to Europe. He had letters of credit to the extent of \$40,000, with the assistance of which he succeeded in making some large contracts. When recognized by Syme, Mr. Evers suddenly left Milwaukee, after first positively denying that he had ever been in St. Louis in his life, and stating that he had only been in America for three weeks. Mr. Syme informed the reporter that Evers is at present a guest in the Commercial hotel. The Wisconsin miller is afraid that he is concocting some scheme which will be injurious to the trade, and hence is anxious that the question as to his identity shall be settled.

Upon the appearance of the article Evers' friends charged Mr. Syme with having wronged an innocent man, that this man was just what he claimed to be, and that Mr. Syme was mistaken in the man. Mr. Syme declined to be convinced but promised to retract the article if a man, whom he named did not confirm his identification. For some reason the referee did not admit that he was able to identify Evers, and in pursuance of his promise Mr. Syme authorized the publication of a card which appeared in the Times of the 8th, as follows:

Referring to an article in your issue of yesterday (7th), headed, "A Sharper's Scheme," based upon information by me furnished to your reporter several gentlemen of this city who have been intimately acquainted with the Edward Evers referred to, having positively stated that Mr. B. H. Evers is not that person I am forced to yield to the preponderance of evidence, and therefore retract the article in question.

The Times criticised Mr. Syme rather severely for slandering a worthy gentleman, and after arriving home, feeling that he was made to occupy a wrong position by the retraction, he wrote a letter to the Republican of Milwaukee, published March 29, from which we make the following extract:

With reference to the card, I wish to say that I authorized it under protest, and in pursuance of a promise too hastily made, and not because I was convinced of any error in my first statement. After the appearance of the article in the Times of the 7th inst., I was met by a friend of Evers who charged me with having wronged an innocent party, and insisted that I should retract the article. I knew I was not mistaken, but not wishing to appear unfair, I said I would authorize a retraction, if a certain gentleman whom I named did not identify this man claiming to be B. H. Evers, as Edward Evers, formerly of St. Louis. For some reason best known to himself, the gentleman referred to did not admit that he identified him. I subsequently brought two well-known and responsible gentlemen of Chicago who did identify him at sight, but adding by the strict letter of my promise, I authorized the retraction although my own belief that I was right remained and was unshaken.

I wish now to say most emphatically that I know this man who has made his advent into this section with such a panorama of credentials under the name of B. H. Evers, of the London firm of Phillips, Marshall & Co., to be in fact the same man who a few years ago operated in St. Louis under the name

of Edward Evers, and, whether he ever went to London or not, did go to jail, for obtaining money under false pretences.

Soon after the retraction was published, Mr. Evers disappeared from Milwaukee and Chicago, and is supposed to be operating among the millers of Minnesota or Iowa at the present time.

Now for the conclusion of this affair. As soon as there was any doubt about Mr. Evers, cablegrams were sent to London by Mr. Seamans and others. It was learned that the house was a new one and were not even settled in their office, 79 Mark Lane, but it was believed the firm had some money, but how much was unknown. Mr. Seamans also wrote to his London correspondent, and April 4th, received a full reply. One of the firm told the correspondent that Mr. Evers had been in the United States before, and that he was extensively acquainted there, and that he was in the United States now soliciting consignments and that they would soon have all the American stock they could sell. This information by Evers' partner, that Evers had been in this country before is directly contradictory to Mr. Evers own statement. Mr. Evers while here also made contradictory statements. To one party he stated that he had been in connection with the firm for ten years and to another but five. If the firm is a new one hardly yet moved into their office as Mr. Seamans' correspondent says, and is reported by the Commercial Agencies who report that the firm is a new one, but presumed respectable, the statements look decidedly crooked. Mr. Symes has stoutly maintained his assertions about this man, and deserves much credit for putting his views before his brother millers. We have given our readers herewith such information as we possess, and they are welcome to use it to their best advantage. It may be that Mr. Evers and the firm he represents desire to do a straightforward, legitimate business.

LATEST.—We have been shown a cablegram, just as we go to press, from London, stating that Mr. Evers has been in St. Louis previous to his present visit to this country. Any millers desiring any further information can correspond with S. H. Seamans, Esq., Secretary of the Millers' National Association, Milwaukee, Wis., and he will give such information as he is or may become possessed of concerning this matter.

New Publications.

ANNUAL REPORT OF THE TRADE AND COMMERCE OF INDIANAPOLIS for 1880, compiled by Henry C. Wilson, Secretary Board of Trade.

This work shows a gratifying increase in the business of the Indiana metropolis. Indianapolis is growing rapidly and bids fair to become a very large inland city.

We have received the Report of the Board of Commissioners of the First International Exhibition, by Geo. E. Gault, President, Cincinnati, Ohio.

SCRIBNER'S MONTHLY for April came to hand full and running over of choice reading and handsome illustrations.

We acknowledge the receipt of the Report of the Expert on Steam Engine Tests, at the Millers' Exhibition in Cincinnati.

We have received *Romola*, a novel by George Elliot, published by American-Book Exchange, New York.

HARPER'S MAGAZINE for April, besides being a very beautiful Number, offers its readers an unusual variety of entertaining reading matter.

The Number opens with a descriptive article, by W. H. Riding, on "The Green Mountains in Sugar-Time," with characteristic illustrations by McCutcheon. Arthur Gilman, the architect, contributes a beautiful and instructive illustrated article on Salisbury Cathedral. "Indian Education at Hampton and Carlisle" is the subject of a very interesting paper by Helen W. Ludlow, one of the Hampton teachers, with fifteen illustrations. "Italian Life in New York," by Charlotte Adams, furnishes Mr. Rogers with a number of picturesque subjects for his pencil. Alexander F. Calder's paper on "Art Embroidery" is full of valuable suggestions on a subject of general interest, and is illustrated with some excellent designs. Ernst Ingersoll contributes an article on Milwaukee, illustrated with seventeen beautiful engravings. S. H. M. Byers, United States Consul at Zurich, in "My Farm in Switzerland" (illustrated), conveys some very useful hints to our farmers as to the economy of agriculture.

The two serial novels—"Anne," by Constance Fenimore Woolson, and "A Laidiccan"—are continued, the former illustrated by Reinhart, and the latter by Du Maurier. Sherwood Bonner contributes a strong story, "Two Storms." W. H. Beard, under the title of "An Artist's Reminiscences," tells a touching story of his boyhood, which he also illustrates with a charming picture. Another side of life insurance, contrasting with that given in an article on the subject in the January Harper, is presented by the Rev. Stephen H. Tyng, Jr. Pouligny Bigelow under the title of "Young Man, Go West," describes the Close colony in Iowa, and shows what results are possible for farming and stock-raising in that section. A lighter paper, of a humorous character, entitled "Darwinian Divorcement," is contributed by F. H. Underwood.

J. T. Trowbridge, in his poem "The Indian Camp," presents a striking picture of the American Indian of today. Other poems are contributed by Walt Whitman, Paul H. Hayne, and William Gibson.

The Editorial Departments are filled with timely structure, and entertaining matter.

In a letter to the UNITED STATES MILLER dated March 8th, Messrs. Ch. Dufourch & Co., flour factors in Paris, France, say: "After a somewhat long state of depression our markets are showing a better disposition. The comparatively large quantity of wheat still required to be imported during the next five months warrants the opinion that the lowest limits have been seen for the current season. Actual prices are as follows:

| | |
|-------------------------|-----------------|
| Hungarian Patents | 49 1/2 @ 55 1/2 |
| French | 40 1/2 @ 44 1/2 |
| Choice French Straights | 35 1/2 @ 39 1/2 |
| Ordinary | 37 1/2 @ 42 1/2 |
| Common Firsts | 38 1/2 @ 45 1/2 |
| Seconds | 33 1/2 @ 35 1/2 |
| Thirds | 32 1/2 @ 33 1/2 |
| Fourths | 31 1/2 @ 32 1/2 |
| Eye flour | 25 1/2 @ 28 1/2 |

Per 220 lbs, packed in sacks. Duty 1/8 220 lbs.

Fire-Proof Construction.

The effort to diminish danger by fire to our construction is one of the greatest importance, and should enlist the energy and all the solicitude of our profession; and even more so in this country, where the difficulties occasioned by the influences of our climate are indeed vastly greater than in the countries of the Old World, from whence we are apt to take our precedents.

The large conflagrations to which many of our cities have lately been exposed have at least taught us this lesson: that the most destructible of our building materials is wood, and the least destructible brick. We should, therefore, as much as possible, discard wood, and instead use brick for our principal building material. Among the many suggestions made after our large fires, there has not been mentioned one system of fire-proof vaulting especially adapted for warehouses and some kind of factories, to which I beg leave to draw your attention for a few moments. This system, which is very common in the north of Germany, where it has existed since the middle ages, is well worthy of imitation, not only on account of its easy and practical execution, but also on account of its inexpensiveness. This vaulting consists of a series of strong elliptical arches, built parallel to each other across the building at intervals, say, ten to twelve feet from centres; the spandrels of these arches are regularly built up to a level, and serve to support flat segmental arches turned between them. As a general thing the arches in all buildings (dwelling houses and others) are arched over in this manner; and in storehouses, breweries, distilleries, etc., you often find four or five stories, one above the other, arched over in this manner. These buildings are built entirely of brick, and are often finished in this manner to the very roof, for which the arches are laid with the proper inclination, and then covered directly with cement, tile or metal. With stairs of brick, walls of iron and inclosed in brick walls, and having doors, windows and shutters of iron, you have a construction as fire-proof as can be made, particularly adapted to storehouses, factories, or to cellars of dwelling houses, and one not more costly if as much as the more modern system of wrought-iron beams filled with brick arches. A fire from the outside cannot attack such a building vaulted over from cellar to garret, and a fire originating inside of it will in most cases be confined to the story in which it started.

Our system of wrought-iron beams filled with brick arches, or arches of other fire-proof materials, has some great advantages: not the least one is, that it gives more available room on each floor, and that it requires less thickness of walls than the former system of all brick. But it is not as fireproof on account of the exposure of the iron to the fire; this danger ought to be overcome.

In order to diminish this great danger to the iron beams, a thick coat of plaster of Paris can be stuck to the under side of the beam for protection. For this purpose the arches may be started one-half inch below the lower edge of the beams, and this will give a coat of at least one inch thick the requisite support from and attachment to the arches.

To protect from the heat the end beams at well holes, also iron girders composed of two X beams, and to give them at the same time an inexpensive finish, I have lately used stout hoop iron (8-16 by $\frac{1}{4}$ inch), stretched and bound tightly and riveted around the beams

every eight inches from centres; the open channels at the sides of the beams are then filled in and built up with brick laid in cement. The hoop iron keeps the brick in their places till the cement has set; afterwards the sides and bottoms are plastered, and moldings run on them if desired. If the girder beams are far enough apart to allow the mason to reach with his hand inside, then the cavity between them is filled in with bricks likewise. This device gives some considerable protection against heat in case of fire, and the advantage of not being costly.

For storehouses, factories, etc., where the danger of fire is greater, a good protection to cast-iron columns and wrought-iron girders might be built by inclosing the columns in brick piers. Suppose an 8-inch or 12-inch column; build an 8-inch wall around it: this would make a pier of 24 inches or 28 inches square. To protect the girders, turn, in direction of the same, from pier to pier 8-inch segmental arches 24 or 28 inches wide, the extrados of the same to touch the bottom of the girders; then level up the haunches, and build 8-inch dwarf walls on each side of the girders to the top of the same. This will give an excellent protection against fire, and where it is most wanted in this kind of buildings.

In most cases, a 4-inch instead of an 8-inch wall would be sufficient; but in extreme cases of storage of inflammable materials the 8-inch walls and arches would be necessary.

In all our buildings the effort should be to build with fire-proof materials, that is, with stone, brick, iron and some of the plaster compounds for partitions and furring. Iron beams, which are the most costly of our materials, should be used as sparingly as possible, and we ought to calculate the strength required at every step of our building operation, so that no more may enter into our buildings than is absolutely necessary. In order to economize in the right direction, let us use as little wood as possible.

A French architect completes his buildings with less than one-half the amount of wood which we put in ours in the way of finish. The less wood we have in them, the less danger of compromising them in case of fire.

In the matter of roofing, there exists on the continent of Europe a very safe kind of tile, which might safely be adapted here. Not that new fancy tiling that has lately been introduced, and is not good for our purpose. The tile I mean is a plain rectangular tile, with a hook at the top to hook behind a wooden or iron lath, 18 or 16 inches long, 6 to 6 $\frac{1}{2}$ inches wide, 4 or 5 inches to the weather, and rendered underneath with cement or mortar; in other words, it is laid like slate. This tile roof can be laid at a pitch of 3 to 4 inches to the foot and is not only a great security against fire, but also, when of the proper material, a very lasting roof. When the sparing use of iron is advocated above, it is for the reason of reducing the cost of the iron construction, and in order to popularize the same. And that this can be done there is no shadow of a doubt. To put the beams as wide apart as their mere or less length of bearing requires, would in many cases reduce the weight of iron to a very considerable extent.

The more we do in this direction, the nearer we come to the period when we can expect to have structures which will stand with credit an attack of fire from both the inside and the outside of the building.—A paper by Detlef Lienau, F. A. I. A., read at the Eleventh Annual Convention of the American Institute of Architects.

A Milwaukee Grain Elevator.

In order to begin at the beginning—get to the bottom, as it were, of an elevator—one must climb to the very top. The building is perhaps one hundred and fifty feet long by seventy-five feet wide, and, like all of its class, it rises eighty feet or more to the eaves, above which a narrow top part forty or fifty feet higher, is perched upon the ridge-pole. It is built of wood, sheathed with corrugated iron a little way up, and then slated the rest of the way.

Entering one end, where two railway tracks run into the building, we find a narrow wooden stairway, and begin our ascent. The flights are short ones, but eighteen are stepped over before we emerge into the topmost attic. Alongside of us, as we climbed, has been running the strong belt which carries the power from the great engine on the ground-floor to the gearing in the roof—a belt of rubber canvas four feet wide, and perhaps two hundred and fifty feet long.

When grain is brought—perhaps a hundred car-loads from the vast fields of Dakota or the wide farms between here and St. Paul—the train is backed right into the elevator, and stands so that opposite each car door is a receiver which is a kind of vat, or hopper, in the platform. By the help of steam-shovels, operating almost automatically, two men in each car will in ten minutes or less empty the whole train.

As fast as the grain is dumped, the receiver delivers it to iron buckets holding about a peck each, which are attached to endless belts, and travel up a sort of chimney, called a "leg," to this roof chamber. These buckets will hoist 6000 bushels an hour at their ordinary rate of speed. That is equal to one bucket going up 24,000 times, at the rate of 400 times a minute—tolerably lively work! To-day up here in the topmost loft there is nothing doing, and we are saved strangulation. The light hardly penetrates through the cobwebbed windows, and the most pulverous of dust lies everywhere half an inch deep, showing the marks of a few boot soles, many foot-prints of rats, and the lace-like tracks of hundreds of spiders and bugs. You step over and under broad horizontal belts as you make your way gingerly from one end of the attic to the other. They run the fans that winnow the grain as it comes up in the buckets, after which it is dropped into the hoppers, ten feet wide, and twice as deep, that open like hatchways every few feet in the centre of the floor. Now all is perfectly quiet; we are so high that even the clamor of the wharves does not reach us. But when the machinery starts in motion, then fearful roars, and clash of cogs, and whipping of slackened belts, assault the garret, until this whole upper region rocks like a ship in a gale, and chaff and dust cloud the eyes and stifle the throat.

Descending one story, we find another garret, with nothing in it but the square bodies of the hoppers. Going down a second flight shows us that the hoppers are suspended not upon pillars, but loosely on iron stirrups, so as to shake a little, and the iron gate which lets on or shuts off the fall of the grain through the tubular orifice at the bottom is operated by steam.

There are twelve of these hoppers. Sticking up through the floor underneath each one gape the flaring mouths of twelve spouts or sluices, all of which point directly at the gate in the hopper, as though earnestly begging its bounty of grain. Every one of these 144 spouts leads into a bin, near or distant, and all are

numbered, so that the superintendent knows which spout conducts to any one bin, and can distribute his cargoes accordingly, the result of his choice being recorded in cabalistic abbreviations upon a blackboard close by. A movable conductor is swung into place between the hopper and the spout, the gate pulled open, and down slides the wheat, with a musically rushing noise, into the grateful bin.

To see the bins we descend again, this time reaching the top of the wide part of the building. We walk very circumspectly, in the half-light, amid a maze of beams, stringers, and cross-pieces of wood and iron. The whole interior of the elevator below this level is now seen to consist of a series of rooms, between which there is no communication. They are ceilingless, and the only exit from them is through a spout in the bottom. Peering over the edges from the narrow foot-walks, we can only guess how far the person would fall who should lose his balance, for the eye can not reach the bottom: it is sixty-five feet below, and hidden in darkness. Of these deep bins there are 144, some twice the size of others. Sometimes they are all full at once, and hold eight or nine hundred thousand bushels, weighing fifty millions of pounds, and good for over two hundred thousand barrels of flour.—ERNEST INGERSOLL, in *Harper's Magazine* for April.

HOW TO CHOOSE A HAM.—Many have been often puzzled "how to choose a ham." The following simple directions may be of service to assist those in the dilemma:

1. Never buy a ham simply because it is offered at a low price. No really first-class ham is apt to be sold at a very low figure.

2. Never select a ham which is too lean. Although the fat is considered by many to be so much waste, still "a fat ham" always furnishes tender, juicy and fine flavored meat, while a lean ham is very often tough and dry when cooked. The joint should be well rounded and plump, rather than thin or fat. The skin should be thin and pliable.

3. Choose freshly cured hams. Wines improve by age, hams do not. The more recently the joint has come from the curing cask (other things being equal), the better it will please when cooked.

4. As regards the size of a ham, that should depend very much on what you wish to do with it. A whole ham always boils more satisfactorily than a piece. For broiling or frying, a ham of not less than twelve pounds should be selected. One from fourteen to sixteen pounds is preferable.

A REMARKABLE STATEMENT.—Rev. Allen Tibbets, who now lives at Coldwater, Michigan, aged 77 years, makes this remarkable statement: "I never swore an oath, or took a chew of tobacco, or smoked a whole cigar. I never bought or sold a drink of brandy or whiskey for myself. In a travel of over 100,000 miles by conveyances I never met with an accident, or was a moment too late when it depended upon my own exertion. I never sang a song or played a game of checkers, billiards or croquet, or any game of cards. I never skated a rod or struck a man a blow with my fist. I can repeat more of the Bible than any man living of whom I have any knowledge. I have given away more real estate in this city (Coldwater) than all its other inhabitants. I preached for over fifteen years, and traveled more than five hundred miles attending funerals, and all the salary I ever received was a pound of tea, worth seventy-five cents." Gracious Goodness! What a quantity of fun Mr. Tibbets has missed.

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(CONCLUDED FROM MARCH NUMBER.)

GOSSIP ABOUT MILLERS AND MILLS.

The Miller in Story.

The Maid of Abbey Mills' Valentine.

A Legend of St. Valentine's Day.

CHAPTER III.
THE VALENTINE.

On the last night of the year 187—, two men were seated by a bright fire in a snug parlor in the Abbey Arms, Fairholm. The men, who were apparently thirty years of age, were dressed in suits of gray tweed, and had the thoughtful appearance of operatives of the better class, whose position was not unconnected with a sense of responsibility. Apparently, however, they considered the latter, whatever it might be, quite compatible with a moderate enjoyment of such recreation as fairly comes within the reach of men born to the heritage of labor, and the recreation in which they are engaged, as we look in upon them, is the imbibition of the contents of vessels which stood on the table at their elbow—composed respectively of the best Burton and Scotch whisky hot, the latter flavored with a slice of lemon, that the Abbey Arms could supply—with an accompaniment of pipes and tobacco.

The Draper and the Cruickshank feud apparently was not participated in by the servants of the rival houses, as was the case in that more famous feud between the Montagues and Capulets. The two men who were enjoying themselves in the Abbey Arms, were Sandy Ried, foreman of the Enterprise Mills, and Dick Waltham, who acted in the same capacity at the Abbey Mills. The former was a shrewd and somewhat dogmatic Scotchman from the "Land o' Cakes," and the latter, like the family with which he was engaged, was a native of Fairholm. The two men were great friends, all the more so, perhaps, that they held opposite views with regard to wheat mixtures and systems of milling, and they met regularly once a week in the same place to discuss their differences and have a friendly chat on things in general.

"This is by no means the warst flower in the garden on a night like this," said Sandy, applying the poker to a lump of coal in the grate, and making it break out in a brighter flame. "If this weather continues, there'll be fine skating on the ice, although skating's but poor sport compared wi' curlin'—a game ye ken naething about i' the South."

"Well, we have cricket in the summer if you have curling in winter," responded Dick; "and you will admit that cricket beats curling to sticks."

"Indeed," said Sandy, "and I'll do no such thing. Cricket's a game only fit for school laddies. Why, man, it's nothing to be compared wi' golf, and golf itself is noo to be named in the same day wi' curlin'."

"What the use of talking," replied Dick, taking the pipe from his mouth and applying the bright pewter vessel to it, "you know we'll never agree upon that subject though we talk till doomsday; suppose we change the grist. When is young Cruickshank coming back? I heard he was expected at Christmas."

"So he was," replied Sandy, setting down his tumbler after partaking of a portion of its contents, "but he was hindered at a place they ca' St. Louis, where he met an auld friend o' his father, a Mr. Bain, a great miller i' that town, who insisted on his stopping with him a week or a fortnight."

"If he does not look sharp he stands a good chance of losing his sweetheart, as far as I can hear," said Dick in a low voice.

"Losing his sweetheart," repeated Sandy, "you dinna mean to say the jaud's gawn to jilt him?"

"Just keep a civil tongue in your head, Sandy, and call your betters by their right names," said Dick, showing the least touch of temper. "Miss Draper's no more a jade than you're an angel, and a man may lose his sweetheart without being jilted."

"Oh, I meant no offence to the young lady, Dick," said Sandy in a conciliatory tone; "she's as bonny a lassie as ever I clapped e'e on, an' I have more respect for our young maister than think he wad demean himself to fa' in love wi' a lass that was no' as fair o' mind as she was o' face. But what in the world are you drivin' at?"

"What can a young lady think, I should like to know, of a lover who has not sent her a scrap of his pen to say whether he is dead or alive for two months," replied Dick.

"I should say she must either think him a rascal or a sump," said Sandy dryly, "but," he continued, raising his voice and looking

his companion in the face, "if anybody told me that my maister's son had been guilty of such conduct, I would knock him down although he were my ain brither."

"Well, you needn't look at me as if you wished to knock me down. I have said nothing, but I hope I may tell you what has been said without raising your Scotch blood to the knocking down point," replied Dick.

"Oh, say awa," said Sandy, "let's hear what's been said by all means."

"You know our housekeeper, Mrs. Vine nursed Miss Draper when she lost her mother, when she was a little un, and she told the housemaid, Jenney Lightfoot—"

"Ah, Dick, Dick," interrupted Sandy, shaking his head and winking, "I'm afraid you're o'er sound o' Jenny to keep free o' the matrimonial collar lang."

"I can't see that that has ought to do with the present subject," said Dick with a conscious blush, "but if you don't want to hear me I can shut up. I thought you wanted to hear what was said."

"Of course I want to hear, you gowk. You need not be so snappy at me joking about a body can see. Jenney's no that ill-looking a lassie, and you might e'en go further and fare wore; but tak' a look at the Burton, although its cauldrid drink in sic weather, and go on."

Dick did as desired, and, mollified by the qualified compliment Sandy had paid to Miss Lightfoot, proceeded.

"Well, as I was going to say when you threw me out of gear, Mrs. Vine told Jenny that the 'dear maid,' as she calls Miss Draper, had not had a word from her sweetheart for two months, and that she was in great distress about it. The more so that young Draper, whose father, you know, is a London corn merchant, is never from her side, and has the best wishes of her father for his success in putting out young Cruickshank. What do you say to that?"

Before answering this direct appeal for his opinion on a subject which was at once delicate and perplexing, Sandy took the pipe from his mouth and drained his tumbler to the last drop, contemplating alternately for a few seconds the ceiling of the room and the fire in the grate, as if looking for a key to assist him in solving a knotty problem. At last he said, with the slow utterance befitting the importance of the subject:

"I'm not intimately acquainted with your housekeeper, but from what I have seen o' her at the Abbey Kirk an' other places, she seems a dounce body, who would not tell a lie even by way of joke, more especially when the bairn whom she nursed is concerned. I know as little about the lassie Lightfoot, but it's no' likely she would mak' up such a story even in daffin', for so far as I can see she could have nothin' to gain by it. But, dear me! it's hard to believe that Maister Cruickshank, if he's weel an' in the body—and that he was baith within a month past I can vouch for, as I saw a letter to his father from his own hand—could have been so neglectfu' of the young lady as no' to write. I know she is as dear to him as ever lass was to lad. Neither his father nor her father have any great love for the match; for though the ill blood that was raised between the families by that old lawsuit is mostly forgotten, there's na' much love lost between the two auld ones. Young Maister Robert did not care to speak about the lass much to his father, and when a lad's heart is fu' o' a lass, he will speak about her e'en to the trees or the stars if there is no one by wi' sympathizing ears to listen to her praises, and he as often talked aboot her to me. Dog on't, I'm afraid there's been some foul play going; I could tak' my aith he has written, and how his letters have not reached her is mair than I can say."

While Sandy and Dick were talking, Mr. Draper and his daughter were seated in the private office of the former, to which the reader has been previously introduced. Mr. Draper was engaged at his desk with some calculation which was apparently not altogether satisfactory, and Maud had a book in her hand, but, from her appearance, she was evidently more intent upon her own thoughts than those of the author of the work. Occasionally Mr. Draper glanced at his daughter from the private ledger which he had before him, and by and by he shut the latter, and rising from his desk he crossed the room to where Maud was seated and took a chair by her side.

"You'll ruin your eyes poring over those nasty figures night and day, papa. I'm glad you have left them at last. Shall we go to the drawing-room?" said Maud, closing her book.

"I have tried to make your life happy, have I not, my dear?" said Mr. Draper, ignoring his daughter's question.

"Yes, papa," said Maud, listlessly, with her eyes fixed on the fire.

"I have never refused anything you asked, or that I imagined would contribute to your happiness."

"Never, papa," was the reply.

"You know the hopes I had formed with regard to your future, but finding you opposed to their realization, I abandoned them—not without an effort, I admit—but still I abandoned them to please you," Mr. Draper continued, laying his hand caressingly on Maud's head.

"You did, dearest papa," she replied, looking up to him with a smile.

"And you see what has come of it, my dear. Not only has this man who professed to be so anxious to correspond with you daily during his absence ceased to take advantage of the permission I gave him to write to you once a month, but the time has passed when he should have been here to claim the pledge I gave him to consider the proposal he made for your hand, and he makes no sign."

"Oh, papa, don't speak about it, it makes me miserable," said Maud, burying her face in her hands. "Perhaps he may have written; or perhaps he has been ill; you have never inquired?"

"Had he been ill, I should have heard of it without direct inquiry, and had he written, his letters could scarcely have been miscarried. It is not likely I should ask Cruickshank the reason why his son had ceased to hold any communication with my daughter; if he chooses to neglect you, you would not have his father suppose you were miserable in consequence?"

"No, papa," said Maud, rising, "and were I certain that his silence was intentional I would die sooner than show that I cared for him in the least."

"That's right, my girl," was the reply, "and the sooner you decide that he is not worth caring for the better. My cousin will be here to-morrow, and for my sake, Maud, try and think as kindly of his son as possible."

"You know, papa, I would do anything to please, but I can never love James."

"Stuff and nonsense. Never is a big word, my dear, and one does not know what one can do until one tries. You have not tried yet; but after the conduct of young Cruickshank, and when you learn how I stand with regard to my cousin, I think you will try."

"What do you mean, papa?"

Before father and daughter parted for the night, Maud knew what he meant, and learned that unless she complied with his wishes the Abbey Mill would have to be sold to meet losses her father had sustained in some wheat speculations he had joined in, in connection with his cousin.

In a little more than a month bills would fall due, which, apart from the sale of his property, he had no means of meeting; but if Maud could be induced to accept James Draper as a lover, his father would make the meeting of the bills easy. The knowledge she had gained of the exact position in which her father's affairs stood, combined with doubts which, in spite of herself, had taken shape in her mind, with respect to the fidelity of her lover, did not prove a soporific to Maud that night when she retired to rest, but by the time of the arrival of young Draper's father on the following day, she had acquired sufficient command over her feelings to receive him in a manner which made her father hope the best.

Meanwhile time went on and brought no explanation of the silence of Robert Cruickshank to Maud, who, though she had not begun "to try" whether she could "love James," began to think she would have to sacrifice her own inclination, in order to save the credit of her father. By no other means could those unfortunate bills be prevented from falling with crushing effect upon his shoulders; for though his cousin would meet them; and was quite willing to aid his relative in escaping from a difficulty which had to some extent been created through his instrumentality, a union between his son and the daughter of his cousin was insisted upon as an indispensable condition. The union was not demanded as a preliminary to the assistance. If Maud would give her consent to it, the bills would be met at once. She might then arrange with her future husband as to the time for the marriage; and she had almost come to the conclusion to accept what seemed to be the inevitable, and consent to the condition, only stipulating that its fulfilment should be delayed as long as possible.

Such was the state of matters when one night, early in February, Mrs. Vine was informed by Jenny Lightfoot that the foreman of the Enterprise Mills desired to see her.

"What can the man want with me, Jenny?" was Mrs. Vine's not unnatural inquiry. "I never spoke to him in my life."

"He did not say, Mrs. Vine, and I asked him the question; but he's Scotch and as close as an oyster. He only said he wanted to see you very particular. It may be something about the young gentleman," said Jenny.

"Bring him in," said Mrs. Vine; "there can be no harm in seeing him, at any rate." Jenny retired, and in a few moments introduced Sandy to the housekeeper.

Jenny lingered in the room, under pretence of trimming up the fire, hoping to gain some information as to the object of Sandy's visit, but until she retired he was dumb.

"I beg your pardon, mem," he began, after the door had closed on Jenny, "for takin' the liberty o' troublin' you, but about a month back I chanced to hear that our young maister had not written for some time to—ye ken wha I mean;" and Sandy nodded, as much as to say, "there's a delicacy in mentioning names, and with the knowledge we possess it is unnecessary."

"Supposing I do," said Mrs. Vine, in her stiffest manner, "I have no wish to speak on such a subject with a stranger."

"It's very true, mem, that I'm a stranger to you, but I ken you weel enough to feel sure you will be glad to know that oor young gentleman has been guilty o' no remissness of duty, sic as would have been the case had he not written to a young lady, according to solemn promise."

"But he has not written," said Mrs. Vine, forgetting that she had intimated her unwillingness to discuss the subject with a stranger.

"So you think, mem, and so, no doubt, you believe; but, for a' that, it's gospel truth that he has written every month, as I'm tauld was arranged, whatever may have become o' the letters."

"How do you know that?" inquired Mrs. Vine, whose interest was now fully alive.

"I have the information from the fountain-head, mem, as you will see if you cast your eyes o'er that bit letter," said Sandy, handing her a letter, which was as follows:—

New York, Jan. 15th, 187—.

"DEAR SANDY,—You know about the arrangement with regard to Miss Draper and myself made by her father and mine. I have written to her regularly, but have had no reply to my last two letters. I have not mentioned this to my father for fear of the consequence, but I feel very anxious about it. I have heard she is well, and I cannot conceive why she has not written. Would you try and see Mrs. Vine, and ascertain the reason? I sail by the next steamer. Send a note addressed to me at the 'Angel Hotel', Liverpool, saying what you have learned, and I will get it on my arrival.—Yours, R. C."

"I am glad you have shown me this, Mr. —. Excuse me, I have not heard your name."

"Reid, mem, never mind the Mister. I'm best known as Sandy."

"May I show it to Miss Draper?"

"Surely, mem, if you wish it, an' if she will not be offended at me having been written to on the matter."

"I don't think there is much fear of that," said Mrs. Vine, with a smile. "I don't mind telling you that Miss Draper has been very much surprised at not having received the letters referred to by Mr. Cruickshank, and she will be glad to know that the reason is not what had begun to be suspected. From the date of his letter," continued Mrs. Vine, "he must be near the end of his voyage, if he sailed by the next steamer, and when you write, tell him to come on at once. There are reasons, which I must not mention, why he should be at Fairholm as soon as possible."

"I'll tell him so, mem; but tak' my word for't he'll require no spurin' to hasten him here as soon as he gets his fit upon the land."

While Sandy and Mrs. Vine were speaking there was a consultation in the drawing-room, which resulted in an engagement on the part of Maud to give her final answer on that day week to the proposal of young Draper, and, as might be supposed, the proof which the letter shown her by Mrs. Vine gave of her lover's fidelity produced a state of feeling in her mind which was at once exquisitely pleasant and painful.

To accept young Draper, when the lover to whom she had given her heart was hastening home to claim her hand was entirely out of the question, but it was equally out of the question that she should gratify her own and her lover's feelings at the sacrifice of her father. Here were two paths of duty and the choice of either must result in misery; but there was no escape from the choice of one of

them. But for the existence of these terrible bills she would not have hesitated for a moment which path to take, but if these were not met, her father would be compelled to part with property which had been in the family for centuries, and it would be like parting with his life. By taking the other path, she would, of course, part with her life's happiness, but if she sacrificed her father, happiness would be equally impossible. Whatever path she selected must lead to misery more or less unendurable.

After a night of tearful and sleepless debate, Maud was no nearer a decision with regard to the path she was to choose than when the question was first thrust upon her. On the eve of the day on which she had promised to give her answer to young Draper she was equally undecided, and next morning, that of the day sacred to St. Valentine, she descended to breakfast, with a heavy heart indeed, but resolved to do her duty to her father by accepting the condition which could alone rescue him from the position in which he had been placed by an unfortunate speculative transaction.

"Here is a letter for you, my dear," said Mr. Draper, as he gave his daughter his customary morning salute; "you will have time to read it before the others come down. Have you made up your mind what to say to James?"

"Yes, papa," she replied faintly, opening her letter and glancing at its contents, which drew from her an exclamation that made her father look up from a letter he was perusing.

"What is it, my dear?" he said, evidently surprised at the transformation that had taken place in Maud's appearance. When she entered the room she was pale and sad, but now her complexion showed its fairest bloom, and her mouth and eyes were lit up by radiant smiles.

"Oh, papa," she replied, "I shall not have to give James any answer; you must tell him not to ask me for one. I have got such a valentine, and Robert will be here to-day."

"He is six weeks to late, and you must give the answer to James that he wishes, or you and I shall have to go to the workhouse."

"Read my valentine, papa!" said Maud, offering the letter she had received, with a merry laugh.

"Hang your valentine! I have no heart for such rubbish," said Mr. Draper, with more anger than he had ever shown to Maud, but his temper only made her laugh more merrily.

"Then I must read it to you," she said, crossing to her father and seating herself on his knee. "Who do you think it is from—but you will never guess, so listen."

"Dear daughter that is to be, I have known for some time that your other better known, and, as he deserves to be, better loved father, had met with some losses in business which are not unlikely to result in temporary embarrassment. I send you the enclosed as a valentine, which, if my information is correct, will meet the losses in question. It is a free gift to yourself, which you are at liberty to use as you please, and as my son intends paying his respects to you to-day, you can give him an acknowledgment in any form that is most agreeable to yourself."

"Yours very respectfully,

"JOHN CRUICKSHANK."

Little more need be said. As Robert Cruickshank entered the gate leading to Abbey Mill House he met a dog cart, by which Mr. Draper's cousin and his son were being conveyed to the railway station with all their belongings; and Maud's acknowledgment of his valentine resulted, two months later, in a peal of bridal bells, which, rung out the long-standing feud between the Drapers and the Cruickshanks, and rang in the dawn of a period of amity between the families which, it is to be hoped, will be as happy as lasting.

THE END.

Q.

THE Directors of the National Bank of Scotland, in their annual report, state that the profits of the year, after making ample provision for all bad or doubtful debts, and for safety, amount to £155,290 2s 6d, to which add the balance brought forward from the previous year, £23,787 18s 2d, which make together £179,078 0s 7d. The Directors are thus enabled to pay the bank's ordinary dividend of 18 per cent, £180,000; an extra dividend, or bonus, of 1 per cent, £10,000—£140,000; and to add to the rest £15,000, leaving to be carried forward to the next account, £24,078 0s 7d—£179,078 0s 7d. The bank's rest, after laying aside the full sum, £140,000, for dividend and bonus, due in January and July next, will now amount to £55,000, exclusive of the sum of £24,078 0s 7d carried forward. This is decidedly profitable banking.

The St. Anthony Falls Water Power.

The St. Anthony Falls water power proper consists of that part of the falls of St. Anthony that is used on the St. Anthony, or East Side of the river, that of the West Side being known as the Minneapolis water power. The Minneapolis side has many large flouring mills to attest its improvements, but on the East Side the water has been permitted to spend most of its energy on the boulders and rocks lying just below the crest of the falls, and until recently very little has been done to turn the power to the assistance of man. Attempts at its development have been made from time to time by the various parties controlling it, but their efforts were limited and only its partial development resulted.

Mr. Franklin Steele, who died recently in Minneapolis, received a patent in 1849 from the Government of the land adjoining the falls on the East Side of the river and including Nicollet and Hennepin Islands. He immediately commenced its improvement by building a log dam across the east channel of the river, and although the privilege extended half way across the west channel, he proposed to use only the water flowing in the east channel. At the dam he built a small saw mill which contained only one of the old style single up and down saws. In 1854 the Island flouring mill was built, this being the first mill on the East Side of the river and the first in Minneapolis, excepting the old Government mill on the site of which now stands the Northwestern mill.

In 1855, additions were made to the dam, and in 1856 the St. Anthony Falls Water Power Company was chartered, and they then built half of the present upper dam, extending from Hennepin Island to the middle of the west channel. Shortly after this a number of saw and shingle mills and sash and door factories were built, for which the East Side falls furnished the motive power; but all of these were burned, excepting the large sash and door factory situated on Hennepin Island, which was afterwards turned into the present paper mill. Nothing more of importance was done except the rebuilding of one or two of the saw mills until 1871, when a wheel was put in to drive a line of shafting, which runs parallel to the river, and from which the Union Iron Works and several other small machine shops are now driven. The building that now is known as the North Star mill was originally built for a block of stores, but was not used long for that purpose, as it was soon bought by the North Star Iron Works company, and it was in this building that the present flourishing institution bearing that name originated. Finding the premises too small, and being unable to purchase adjoining property at a reasonable figure, the works were moved to the present location on the west side of the river. The building was then converted into the present North Star flouring mill.

In 1876 Messrs. Stamwitz & Schoeber, being pinched for room in their small mill on the West Side, built the present Phoenix Mill which is now a roller mill, making about 250 barrels of flour per day, and bears a good reputation for its brands of flour.

In 1877 the Government dam, at a cost of \$200,000, was completed; this dam consists of a stupendous concrete wall 1,850 feet long, forty feet high, seven feet thick at the bottom and tapering to four feet thick at the top. The bed of the river at, and above the falls is a ledge of blue limestone, about sixteen feet in thickness, and immediately under this is about forty feet of soft sand-stone. The sand-stone is quite soft when subjected to water, but when dry becomes harder. In the limestone there are a great many cracks and crevices, and through these before the government dam was built, much water passed and washed out the sand-stone from under the ledge so as to undermine it, and the ledge being unsupported fell off at the crest of the falls in piecemeal and promised the speedy destruction of the falls. Serious apprehensions were entertained by the owners of the power as to its safety, when the government took it in hand, and put in the dam. It was built under the limestone ledge, for the purpose of shutting off any current of water that might be working its way through the sand-stone, for as long as the current was stemmed there would be no danger of washing out the sand. This of course was not only for the good of the St. Anthony Power, but also for the Minneapolis side. The dam commences 100 feet into the west bank, runs directly across the west branch to Hennepin Island, across Hennepin Island at an angle of forty-five degrees toward the south until it strikes the east channel, which it then crosses at right angles with the current and extends

100 feet into the east bank. This is to prevent washing around the ends. The wall is made of hydraulic cement, sand and broken limestone in the following proportions: One part cement, two parts sand, and five parts broken stone. This concrete after standing a few hours becomes as hard as solid rock, and the dam is one solid wall without a seam, a crack or joint in its entire surface.

In the early part of 1880 Messrs. C. A. Pillsbury & Co. completed negotiations with the water power company for power to run the large flouring mill that is now being built by them. It was the intention of the company then to build a short head race from the river near by to the site of the mill. This would not have cost much, but it would have sacrificed about ten feet of head, for by making a head race about 400 feet long the water above the first mentioned log dam could be reached and used. A month later, about the time that Messrs. Pillsbury & Co. commenced operations on the mill, the water power company sold the entire power with the exception of a few privileges to J. J. Hill, the general manager of the St. Paul, Minneapolis & Manitoba railway, for the sum of \$425,000. The few privileges excepted were bought by W. W. Eastman for \$40,000, but he shortly afterwards sold them to J. J. Hill for \$42,500, giving Mr. Hill the entire power for the sum of \$467,500. It was Mr. Hill's intention to immediately improve the power to its full capacity, and two or three different methods of its accomplishment were designed and drawn out, but owing to differences of opinion as to the best method to pursue, and the great pressure of other business, the time for commencing operations was permitted to run along until January of this year, when it was found to be too late to complete any method before the Pillsbury mill "A" would be ready for it, and as the new proprietor had promised that the water should be in readiness by the time the mill was ready to run, there was no alternative but to build a small canal for the exclusive benefit of the Pillsbury mill, and not attempt the full development of the power until later, and in consequence a small canal is now being built. The mouth of the canal is about fifty feet above the old dam; it leaves the river at right angles, and runs in that direction about seventy feet and then turns on a quadrant and runs parallel with the river about 400 feet, where it reaches the mill. The excavators are now about twenty feet deep the whole length of the canal; at this depth the limestone (or a soapstone which covers it) is reached, and there will be from five to ten feet of this to be quarried out. The upper surface of the ledge is quite uneven, and the soapstone is not found in the bed of the river at all, having probably been moved or washed away by the current of the river, and in order to get to the bottom of the canal as low as the ledge in the river all this must be quarried out. When completed the canal will be fourteen feet wide in the clear, and in low water is expected to carry ten feet in depth. It will have sufficient pitch or grade to give the water current of about six feet per second. The cross section of the water will be 140 feet, and at six feet per second will conduct 50,400 cubic feet per minute. In the forebay at the mill it will be enlarged to twice its capacity in order to arrest the rapid flow of the water, that it may go to the wheels at a rate of not more than three feet per second. The wheels will not take over 16,000 to 17,000 cubic feet per minute, but a surplus is always a good thing to have to make provision for the clogging of racks, extremely low water, slush, ice and sediment being deposited in the canal. The walls on each side are to be four feet thick, and are to be coated with hydraulic cement. The whole canal will be arched over with stone, with occasionally a man-hole left in the arch to provide for getting into it. At the head of the canal will be a large iron rack twenty-five feet long; the mouth is divided by a heavy pier of masonry, and on each side of this will be placed a set of gates, or one gate in three sections, which will be lifted by hand wheels working a worm gear and ratchets in much the same manner as all such gates.

For the further development of the power it is proposed to build an open canal fifty feet wide, running it along the bank of the river, and branching off smaller canals to mills, etc., as needed. As most of the land that now belongs to the power is three blocks below the crest of the falls the water will have to be conducted a distance of over 1,000 feet before the company can use it on their own premises; but there is an offset to this grievance, and that is, that owing to the heavy grade of the bed of the river below the falls, enough head

is gained by carrying it down to pay the extra expenses.

When this work is completed there will be plenty of room and power for more mammoth flouring mills, and Minneapolis will never stop building them until she leads the world in capacity and exhausts all her wheat resources, which it is safe to say will not be for a good many years to come.

The Driving of Nails.

BY MR. DUDLEY BLANCHARD.

[A paper read before the New York Polytechnic Institute.]

In writing an essay upon any theme, said he, the author is usually expected to give something of the origin and history of the subject—to go back, at least, a few centuries, so as to get, as it were, a good start, the impetus of which may assist in carrying him over the dryness of the subject, and save him from getting stuck upon the dusty desiccation of practical experience. But of this resort of the hard-pushed essayist I cannot avail myself. There is no open ground behind whereupon to make a run at my subject. There is really no literature upon the subject of driving nails that I can call to mind. Yes, I have a dim remembrance of some vicious Amazon driving a nail into somebody's head, once upon a time; but this I do not consider a creditable example of the mechanical skill of antiquity, and so will pass it by. Perhaps I might take a hint from Dickens' editor, Pott, of the *Eatonville Journal*, who wrote an essay upon Chinese metaphysics, and read up in the *Encyclopedia* under the head of D, for driving, and under the head of N, for nails. But attempting to drive a nail encumbered by two heads, in this way, would prove a disastrous failure. There would be no point to the subject. So I will not go to Pott upon the emergency, but gather up what my own recollections afford upon the subject.

The first nails were probably door nails. I infer this from the old adage which describes them as being excessively dead. No other nails are as dead as door nails. Am I not warranted in assuming, therefore, that they are the most ancient of their species? There are certainly no nails in doors of good style nowadays; but whether this is due to the extinction of the species or not, I cannot decide.

It seems a simple and easy enough matter to drive a nail, but not one person in a thousand can drive one with the greatest possible effect where considerable skill and judgment are needed to this end. Most mechanics whose peculiar trade requires the frequent exercise of this operation neglect to study the subject properly, and drive a considerable percentage of their nails in an inefficient and useless manner. And amateurs, whose operations are usually upon subjects of the most difficult kind, almost invariably fail, usually doing more harm than good, by splitting the wood and rendering it more difficult for the most skillful to insert a reliable nail. I have counted twenty-three nails driven to repair a wheel-barrow, only five which did any good at all. All the rest either split the wood or crippled or deflected at the point. And this is not an exceptional case. Examine any article of domestic use that has been repaired with nails by amateurs, and you will probably find that a large majority of them do more harm than good. Yet a little judgment and thought upon the subject would direct us where and how to insert a nail in any difficult case, so as to have the desired effect.

Not long ago I obtruded some unsought advice upon an experienced carpenter, who was vainly trying to insert a small nail effectively into the thin edge of an ornamental pattern to repair a split. The edge being only a quarter of an inch in thickness, the nail refused, in spite of his best skill, to confine itself to the limited section of the wood, but insisted upon protruding itself upon one side or the other. After repeated failures, he reluctantly consented to take a lesson upon the subject, and can now drive a nail under similar circumstances with the necessary precision.

In nailing boards upon timbers, the simplest and plainest of all the various phases of nail-driving, at least one in ten is usually lost by carelessness on the part of the operator, or defect in the nails themselves. And in the more difficult operations, as of box-maker's or joiner's work, a much larger percentage of waste is suffered. In an average lot of window frames, at least one nail in five, or twenty per cent. of all, will be found to be so driven as to be useless.

If I am anywhere nearly right in these estimates it will be seen that here is, in the aggregate, an immense loss, though I have no

data by which to estimate the amount of nails used; but the percentage wasted is certainly as high as I have put it. An improvement in nails effecting their driving qualities is beginning to make its appearance, but is as yet treated with coldness and neglect by mechanics. Nails ought to and will ultimately be made chisel pointed. They penetrate easier, drive straighter, and hold firmer than square pointed ones. But the pointing must be done perfectly; otherwise it induces deflection and misdirection in driving. Nails pointed in cutting are quite certain to get enough ruggedness or irregularity at the extreme point to effect deflection, like the rudder of a ship. The pointing, to have the requisite accuracy, must be done upon the filing principle, which involves, however to a great complication of machinery.

Mr. Blanchard here exhibited a small piece of board a quarter of an inch thick. Into its edge, said he, I have driven eight nails, or two-inch brads. Four of them I sharpened with a file before attempting to drive them; the other four I drove in their natural state, as an Irishman might say. Those that I pointed followed the thickness of the board perfectly, while all the others ran out, nor could I or any one else succeed in confining them to the limited thickness.

I would recommend any carpenter's apprentice to make a special study early in his apprenticeship of the art of driving nails right. This question applies, of course, to all branches of all trades; but my reason for specially urging it in this case is that it is usually neglected at the time when it is most important. Nearly every boy thinks he can drive nails well enough; and by neglecting to correct his hand while his faculties are flexible he acquires a careless habit that follows him through life. Let any youth who expects to do this as a part of his trade study to give his nails the right direction. Let him sight and enfile them cautiously. He will thus acquire a habit of precision that he will adhere to habitually and instinctively in after life.

If any one not expert at the art has occasion, as most people will some time or other, to drive a nail in repairing something, let him see to it that he selects a good, sound one. Some nails are treacherously defective, and cripple at the first blow. And if it is to be driven into any wood harder than spruce, let him sharpen it like a cold chisel at the point. Almost any house can furnish some kind of a file that will answer for this operation. And let him rub the nail with beeswax. A nail thus prepared will penetrate most kinds of wood without difficulty and has little tendency to split the wood. A hole should be bored when the means of doing so are at hand; but this may be neglected if other precautions are duly taken. A suitable hammer is not always at hand.

The face of the typical hammer of amateur practice is usually worn and rounded, which augments the difficulty greatly. But whatever hammer you use, rub its face vigorously upon a brick or a piece of sand-paper, or upon some sand or gravel upon a board. This will clean the face—sharpen the teeth, as it were—and multiply the chances of an effective impact. By attention to these and such other precautions as common sense may suggest, any one may successfully accomplish the vexatious task of driving a nail so as to do the most good.

Nails are now driven by machinery, in most box factories where sufficient system and repetition exist to make it profitable, one machine doing the work of from ten to fifteen men. The general idea of these machines is as follows: The nails are fed by hand into bell-shaped holes in a revolving disk. These holes are arranged in radial lines, each line with as many holes as there are nails wanted along the side of a box. This disk revolves and delivers the nails into bent tubes, each nail to a separate tube, which delivers it to a kind of a pair of nippers arranged in a row with others. Upon receiving their nails, the nippers advance simultaneously, so as to bring each its nail under a kind of stationary hammer, the point of the nail protruding below the embrace of the nippers. At this point in the operation, the box upon a sliding platform rises until the points of the nails penetrate it to a certain extent, when the nippers relax their hold and recede, the box still rising to receive the entire penetration of the released nails, the stationary hammer acting upon the heads of them meantime. This nails one edge of the box; but all the edges having the same arrangement of nails are finished by a repetition of the above movements. Then, to do the ends, the boxes are transferred to other

machines, or the same one can be readjusted when a sufficient number of boxes have been passed. These machines work with rapidity and precision, not one nail in many thousands failing to enter properly.

Self-feeding nail machines are beginning to occupy the attention of inventors with some degree of success. What are technically known as nails range from 1½ to 6 inches in length, and from 800 down to 10 nails to a pound. But the genus extends upward, under the special name of spikes, to 2 feet or more in length, a single one of which will weigh from 6 to 15 pounds, and downward, under the name of brads, to ¼ of an inch in length, and to 10,000 to a pound.

A short discussion followed, during which Dr. Trimble asked to be informed as to the origin of the term "tenpenny nail."

Mr. Stetson, the chairman, ventured the explanation that "tenpenny" was a corruption of "ten punny," from "ten pun," meaning ten pounds to the thousand.

Mr. Hudson would only undertake to say that "tenpenny," as applied to nails, was an old English term applied two or three hundred years before the cut nails of the present day were made.

The rational explanation was given by a gentleman who said that originally, when nails were made by hand, the workmen were paid so many pence per hundred, and in that way the nails got their names, as "fourpenny," "fivepenny," "tenpenny," etc.

Missouri Water Power.

Had Missouri been peopled for the last sixty years by the overflow of population from New England, she would doubtless be a manufacturing prodigy. The motors with which nature has furnished her so lavishly would by this time have been turned to full account, and would be famous as the agents of an enormous productiveness in a great variety of lines. No Eastern State is credited with having such an aggregate volume of available water power as investigation shows Missouri to possess. Yet her labyrinth of rapid, dashing streams, and her multitude of perennial springs, have scarcely any reputation away from their own neighborhoods. Probably few Missourians have an adequate conception of the amount of energy which is daily going to waste through the State in the shape of unused but valuable water power. But only when Missouri is thoroughly canvassed can the possessions of her 113 counties be fully realized. The Southern half of the State is abundantly supplied with large springs; yet, taking the State over, there is seldom a section of land without its overflowing fountain of water. The one called Bryce's spring, on the Niangua river, is probably the largest. It discharges 10,927,000 cubic feet per diem, and flows away a swift stream forty-two yards wide. Its temperature is steady at 60° Fahr., and ice never forms near it to impede machinery. Its flow is regular, so that the machinist can know just what power to depend upon the year round. Upon the upper courses of eleven Missouri rivers, most of which are more or less navigable, fine water powers are to be found at intervals of from one or two to five, ten or fifteen miles. True, to make these powers available, the rough descents where they exist would generally need to be supplemented by the usual artificial appliances, such as dams or means of confining the channel to a narrow space; but, happily, at these rapids the beds of the streams are invariably rocky, thus affording a sure foundation. Though the average annual rainfall of the State is forty-one inches, springs constitute the reliance of our streams for a steadfast flow of water. Several hundred springs are known to be large and forcible enough to supply the power required to run an ordinary mill or factory. Some years ago a scheme was considered for creating a water power on a grand scale adjacent to our city. Now that prosperous times have returned it is likely to be taken up again. Surveys showed it to be practicable to tap the Missouri river near the northwest corner of St. Louis county, with a canal which should pass down a valley to Creve Coeur lake, a large body of water about sixteen miles from the city. From this lake to the river Des Peres, in the southern part of the city, a fall of thirty-two feet would be obtained. On this canal factories could be located, at points a mile apart, without any danger of interference from back-water. Raw material could be supplied and goods could be shipped directly and cheaply to and from the mills by river barges. By being situated near the lake mentioned woolen mills could always be supplied with an abundance of excellent soft water, perfectly free from those metal-

loids and other objectionable elements which are said to render the water of the Mississippi unsuitable for cleansing wool and bleaching goods. To this character of the water, by the way, is attributed the absence of woolen mills in our city.

Stones Clinging to Under Side of Ice.

G. M. Phillips, of Lewisburg, Penn., communicates to the *Scientific American* his ideas in regard to the not uncommonly observed phenomena of stones found clinging to the under side of ice. This is often seen where the water is several feet deep; but never, we believe, in still water, and usually in very rapid running streams of from two to four feet deep. This phenomena was displayed the past winter upon a very large scale in the Susquehanna river, near which Mr. Phillips resides. He writes:

"More than 200 years ago Dr. Plot, of Oxford, Eng., described similar occurrences in the Thames, and gave at least a partial account of their true cause. It is well known that water, like most other substances, contracts under the influence of cold until it is reduced to a temperature of 39 deg. But if its temperature is lowered still further it expands until reaching 32 deg., when it freezes, by which its bulk is increased much more than by its cooling from 29 to 32 deg. Hence it is that water begins to freeze at the surface, since, when near the freezing point, the coldest water, being the lightest, is found upon the top, and is that which freezes first.

"But when the weather is very cold, and the different parts of the stream are thoroughly mixed by rapids or some such mechanical action, the water may be about the same temperature at all depths, and be lowered altogether nearly to the freezing point. In this case the water will begin to freeze at the bottom, because it is stiller there, and perhaps because the stones and bottom have lost some heat by the free radiation and by contact cool the water. Although so much lighter than the water this ice would not rise as soon as formed, for it would be frozen fast to the bottom and the stones lying upon the bottom. But as soon as its size gave the cake of ice buoyant power enough it would tear itself loose from the bottom and the larger stones and rise to the surface, carrying with it the smaller stones and gravel. Then it would be frozen in with the surface ice, keeping its curious load frozen fast to its under surface.

"In November the weather became suddenly very cold, the thermometer sank to 3 deg., and the river was frozen over in one night, a very unusual occurrence. Moreover the place where the phenomenon occurred was just below the dam, where the current was swift and the river rather shallow. All of these would tend to mix up thoroughly the whole mass of water. These circumstances prove the above to be the true explanation.

"In the Thames, stones weighing as much as eight pounds have been known to be raised up from the bottom of the river in this way. Under favorable conditions, and acting through a long time, the ice, by carrying these materials down stream, must cause geological effects which are not inconsiderable."—*Northwestern Miller*.

A HUNGARIAN chemist has lately shown some surprising experiments in Paris with a new light-giving substance which burns with so little heat that its flame will not set fire to a handkerchief, carpet, or other fabric with which it may come in contact. A person may hold the burning liquid in the hand without injury. This new illuminating fluid is prepared from petroleum.

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MOLESWORTH.—*Pocket-Book of Useful Formulae and Memoranda for Civil and Mechanical Engineers*. By GUYFORD L. MOLESWORTH, Member of the Institution of Civil Engineers, Chief Resident Engineer of the Ceylon Railway. Second American Edition, from the Tenth London Edition. In one volume, full-bound in pocket-book form, \$2.

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Any other books, either domestic or foreign, that our readers may desire, we shall be pleased to obtain and furnish to them at the lowest rates, postpaid, to any part of the

NEWS.

EVERYBODY READS THIS.

ITEMS GATHERED FROM CORRESPONDENTS, TELEGRAMS AND EXCHANGES.

The new flaxmill at Appleton Wis. is completed.

Indianapolis elevators have a storage capacity of one million bushels.

Felmlee & Moore's mill at Quincy, Ill. was recently burned—Loss total.

H. C. Austerburg, miller, Ansterburg, Mich. has gone out of the business.

Jay Gould contemplates erecting a large grain elevator at New Orleans.

John W. Cook's mill at Wathona, Kansas, was burned recently. Partially insured.

W. V. Kees & Son, millers, Lebanon, Ill. are succeeded in business by Peter Kullman.

D. Neyhart & Co., owning flour-mills at Auburn and Throopville, N. Y., recently made an assignment.

A Bohemian miller named Wog'ta Stransky is the independent candidate for Probate Judge in Kewaunee Co. Wis.

Gov. C. C. Washburn has gone to Hot Springs, Ark., for the benefit of his health. His two brothers will remain there with him for some time.

Indianapolis, Ind. has 12 flour mills employing 119 persons and they turned out during the year ending May 31, 1880 a product valued at \$1,653,535.

Michael Keiser, of Clarks, Ohio, has recently purchased of C. F. Miller, of Mansfield, Ohio, one No. 1 Eureka smutter and separator, bolting cloth, and other materials.

Oelze & Bro., of Cloverport, Ky., are enlarging the mill which was built for them by Nordyke & Marmon Co., four years ago. The same firm has the contract for the new machinery.

A roller mill of 200 barrels capacity has just been finished and started up at Sand Beach, Mich. It is running night and day, and producing a grade of flour which is said to be of first excellence.

Porter & Cannon, of Deerfield, Mich., who lost their flouring mill by fire last December, are rebuilding it, and have purchased the necessary machinery of Nordyke & Marmon Co., of Indianapolis Ind.

Amos Keller, of Palo Alto, O., has added one No. 3 Excelsior purifier, bolting cloth, elevator buckets, belting, and other materials, all from the mill-furnishing house of C. F. Miller, Mansfield, O.

A neat three run new process water mill is being built at Farwell, Mich., by Geo. L. Hitchcock, and the entire machinery is being manufactured for him by Nordyke & Marmon Co., of Indianapolis, Ind.

Messrs. Lee, Wise & Kirk, of Douglas, Kan., are building a four-run steam mill at the above place, and Nordyke & Marmon Co., of Indianapolis, Ind., are getting out the machinery for the same.

George W. Gridley, a California pioneer, whose gift of a sack of flour to the national sanitary commission was a means of putting \$50,000 in its coffers, died recently on his estate in Butler county.

J. B. Miller & Co., Ashley, Ohio, have recently purchased one No. 1 California brush smutter and separator, bolting cloth, belting, elevator buckets, etc. C. F. Miller, of Mansfield, O., placed the order.

W. H. Mitchell, of Edmonton, Ky., is about to build a three-run flour mill at a station on the L. & N. railroad, called Horse Cave. He gets all the machinery of Nordyke & Marmon Co., of Indianapolis, Ind.

The Messrs. Herzer, Millersburgh, O., have formed a partnership with M. H. Steele, formerly of Cleveland, O., under the name of H. & C. Herzer & Co., and design to build a mill of 125 barrels daily capacity.

George Schaaf, Westfield, O., has added one No. 3 Excelsior middlings purifier, bolting cloth, leather and cotton belting, elevator buckets, etc., all of which were furnished by C. F. Miller, of Mansfield, O.

The flour mill of Messrs. J. & E. A. Plank, of Butler, Ohio, has been newly furnished throughout and fitted complete as a new process mill by C. F. Miller, of Mansfield, Ohio. It is turning out fine work, and is one of the best-equipped mills in Ohio.

George W. Gridley, one of the pioneers of Butte county, Cal., is dead. He will be remembered as the man who, during the war, gave to the Sanitary Commission a sack of

flour, which was sold and resold in all the principal cities in California and Nevada, and then sent East and again resold, realizing altogether over \$50,000.

Mr. Homer Baldwin's mill at Youngstown, Ohio, had its floor covered a foot deep with water during the recent freshet. As the operatives expressed some disinclination to swim, it became necessary to stop the mill for several days. About April 1st Mr. Baldwin expects to start up the Diamond Mills, which he recently bought and fitted up.

The Pearl Hominy Co.'s mill, situated on North and John streets, Baltimore, was destroyed by fire, together with its entire working apparatus and contents on March 4th. The fire, which originated on the second floor, spread with such rapidity, that before the firemen could reach the mill, it was in ruins. The loss is estimated at \$70,000, with an insurance of \$55,450.

They have what they call winter oats, in Oregon, that are sown at any time during the year—say from the last of September up to the middle of March, provided the ground is in favorable condition. These oats are used chiefly for milling; they yield larger grain, heavier and more uniform in size, than summer or spring oats, and at the rate of from forty to eighty bushels per acre.

As an instance of the energy displayed by Americans in their business undertakings it is worthy of mention that Mr. Washburn, of Minneapolis, has recently had some Minnesota wheat shipped to Liverpool, and reshipped to Hamburg to be tested by Nagel and Kaemp's process. The result of the experiment gave 79½ per cent of flour from the uncleaned wheat, or over 80 per cent of the cleaned wheat. A very large per centage of this flour is said to have been of the finest quality.—*Corn Trade Journal.*

J. W. Birdwell, of the Victor Wheat Heater Company of Minneapolis, reports sales of the Victor wheat heater and Gate City steam generator to the following parties within the last few weeks: R. Gregg & Co., Cannon Falls, Minn.; Burton & Jones, St. Paul, Minn.; E. N. Torrey, New Prague, Minn.; Thomas Hillier, Long Lake, Minn. (one generator); G. W. Florida, Rockford, Minn. (one generator); Sidle, Fletcher & Holmes, Minneapolis; J. R. Cross & Co., Minneapolis; H. Oswald, Crystal Lake, Minn.; E. Wunsch, Astoria, Minn. (one generator); Plaff & Hillger, Winnebago, Minn.; Charles Jennings, Monticello, Minn.; Crown Roller Mills, Christian Bros. & Co., Minneapolis; McHenry & Dennison, Logan City, Neb. (one generator); Dinmoody & Corson, New Richland, Minn.; John Gaddis, Fairfield, Ill.; Isaac W. Stanley, Glenwood, Mo.; Hulbert & Son, Dayton, Minn.; J. H. McAtfee, Bloomington, Minn.; J. Wankey, Prior Lake, Minn.; P. H. Hughes, Menomonee, Minn. (one generator); D. A. Ward, Delano, Minn. (one generator); Moorehead Mfg. Co., Moorehead, Minn.; T. O. Kilburn, Spring Valley, Minn. (one generator); C. J. Woolsey, Baldwin, Wis.; J. H. Iseling & Co., Sheldon, Iowa; Samuel Harriman, Somerset, Wis.; Logan & DeMoot, Long Lake, Minn.; H. J. G. Crosswell, Minneapolis. From one to twelve heaters have been placed in each of the above mills, and it has been learned that the roller mills have to use them.

Milwaukee Items.

Smith Bros., of Milwaukee, are now busily engaged in placing the machinery in S. Hansen & Bros. new malt house.

H. Nunnemacher & Co., of the Star Mill, have recently received an order from Europe for 10,000 sacks of patent flour.

Jas. K. Scribner, of Eldorado Mills, Wis., has left his order for gradual reduction rollers with E. P. Allis, all of the Gray type.

Peters & Bernhard, Fort Madison, Iowa, are making extensive improvements in their mill, and are adopting the Gray roller mills exclusively.

Smith Bros., Millwrights of Milwaukee, are putting in a new flume and water-wheel for the mill belonging to R. Hooper, at Lake Mills Wis.

Hon. Henry Herzer, member of the Wisconsin Assembly, will soon return from Madison and again be on hand at his mill-pick works on the canal.

Smith Bros., the Milwaukee millwrights are now making the plans for a new grain elevator for Asmuth & Krause in connection with their malt house.

C. L. Douglass & Co. have fallen in line with the many millers, adopting the gradual

reduction system, and are fitting their mill up with the Gray noiseless roller machine.

The old Bertachy flouring mill property, on the northwest corner of Knapp and River streets, was conveyed to Julius Zahn, by P. C. Quentmeyer and Charles Freischmidt, for \$17,000.

The proprietor of a Milwaukee grain mixing establishment, recently purchased at auction for \$2,500 the pile of grain remaining in the ruins of a burned Minnesota elevator. He has run it through separating and cleaning machinery and has cleared over \$10,000 by the operation.

Rushing into the great roller whirlpool are the following prominent millers, and all are adopting the famous Gray machine, manufactured by E. P. Allis & Co.: Buffalo Milling Co., Freeport, Pa.; Herzog & Roberts, Racine, Wis.; McDaniels & Wright, Franklin, Ind.; H. C. Gustavus, Oshkosh, Wis.

L. H. Lanier & Son, Nashville, Tenn., have contracted with E. P. Allis & Co. for a complete 300-barrel roller mill, using 21 of Gray's patent roller mills and an 18x48 Reynolds-Corliss engine. Allis & Co. will arrange all the machinery in the mill and receive in compensation for the material and other services about \$60,000.

W. D. Gray, while in New York City, lately, contracted with Geo. V. Hecker & Co. of that city to put in 40 of his machines in the Metropolitan Mills. The corrugations of these rolls are of their patent sharp form, and take the place of the ones of other make used by Messrs. Hecker & Co. This change of rolls has been made after a thorough test of both kinds.

Flour Manufacture at Indianapolis, Ind.

[By Henry C. Wilson, Secretary of the Indianapolis Board of Trade.]

The year 1880 will be remembered by millers as one of great activity and revived prosperity. It opened with business in a very unsatisfactory condition, but at its close, manufacturers were full of orders, mills running day and night, and the ledger accounts of such mills as were provided with modern machinery, showing the largest net profits, for the time, ever known to the trade in this city. During the first half of the year, only such manufacturers as had an established order trade, whose brands commanded fancy prices, were able to run their mills without a loss. These unfavorable conditions of trade were due to the high speculative price of wheat in American markets; prices in this market ranging 10 to 20 cents per bushel above its value to manufacture into flour. After harvest, these conditions changed, and values settled to a figure that afforded the manufacturer a good remuneration.

Following this a brisk demand sprung up. Several years of short crops abroad had reduced stocks very low, and the high prices prevailing the early part of the year deterred dealers from replenishing beyond immediate wants. With the decline in wheat, large foreign and American orders began to come in for flour, which was found to be in light supply throughout the world. The demand continued uninterruptedly throughout the remainder of the year.

Supplementing these favorable conditions, were comparatively steady markets for wheat; but producers have not been free sellers, and large stocks are still held in first hands and come slowly to market, despite the active milling demand.

This valuable industry should be quadrupled at this point. Flour is manufactured here more cheaply than anywhere else in America. The reasons are obvious; we are located in the center of immense wheat fields, and the raw material and products are handled in this city without drayage. Slack coal is delivered at mills in car loads on the track at \$1.05@ \$1.15 per ton.

Our export trade in flour shows a healthy and satisfactory increase. Large sales are made direct to principal ports of Great Britain, Holland, Belgium, and to many ports in Germany.

Flour for export is mostly packed in jute or cotton sacks, of size to suit the trade of the country whence destined; and these advantages of direct sale, affording perfect duplication of orders, have greatly stimulated the foreign trade. The total manufacture in 1880, was equal to 259,500 barrels. But for the loss of the Hoosier State Mill, which was destroyed by fire in July (now being rebuilt), the product for the year would have reached a grand total of 300,000 barrels. As it was, it exceeded by 50,000 barrels, that of any year in our history.

Personal.

Messrs. N. Hawkins & Co. and Messrs. Charles & Swenson, of Chicago, have recently sold out their respective mill-furnishing businesses to Messrs. Thornburgh & Glessner, now located at Nos. 47 and 49 West Lake street, Chicago.

Among our visitors during March, we are pleased to note the following names:

R. L. Downton, St. Louis, Mo.
Tom Miller, St. Louis, Mo.
A. Syme, Menasha, Wis.
S. H. Seamans, Milwaukee, Wis.
B. H. Evers, London, England.
M. Buck, Delafield, Wis.
Henry Hamper, Silver Creek, N. Y.
W. Kuhn, Delafield, Wis.
Notbom Bros., Janesville, Wis.
S. Potts, Minneapolis, Minn.
W. W. Beardsley, Silver Creek, N. Y.
P. G. Monroe, of the *Millers Journal*, Chicago, Ill.

Albert Hopkin, Esq., editor of, the *Northwestern Miller*, Minneapolis.

E. P. Bacon, Esq., Milwaukee.
Mr. T. M. Knox, of Chicago, Ill.
Wm. Lehman, Milwaukee, Wis.
Mr. H. Smith, of Smith Bros., Millwrights, Milwaukee, Wis.

Grain and Flour Trade Notes.

GERMANY.—The Berlin market has admitted a decline in wheat, but Hamburg is firm. Rye remains very dear. 42 shillings is quoted at Hamburg, and 43 shillings 3d at Berlin. Highest prices, however, are thought to be past.

AUSTRIA-HUNGARY.—The recent firmness and advance in the wheat market has given place to a decided retrograde tendency. Trade has become slow; grain is cheaper, and difficult to move.

THE recent Australian wheat crop was not more than three-fourths of the previous yield, so that Europe must not look for such shipments as characterized the year 1880. New Zealand, however, has a good crop, and will export satisfactorily. Wheat will also be shipped to Cape Colony.

ST. LOUIS.—Several tow boats and barges left March 31st with 170,000 bushels of wheat and 137,000 bushels of corn for New Orleans, there to be transferred to Europe. They also had about 4000 tons of general merchandise.

RATES are reduced from Chicago to New York on grain, provisions and live hogs 5 cents, commencing April 1, thus making rates on grain 30 cents, and on provisions and live hogs 35 cents. These rates remain in force during the summer months.

THE prospects for a good crop of winter wheat in Wisconsin is said to be very good. The snow has kept the plant from freezing out.

ALBERT RHODES, United States Consul General for the Northern District of France, states that the importation of American cereals in France has increased almost beyond all calculation. So far as wheat and corn are concerned the Americans have driven European competition out of the field. According to the reports of his agents, the importations of American wheat, in his district alone, amounted to between \$25,000,000 and \$30,000,000, an enormous increase over the preceding years. Indeed, on his starting from Rouen a fortnight ago a prominent friend, a wheat merchant, assured him that if the price of American wheat were to fall 10 per cent more it would drive French wheat completely from the market. And that since his departure this fall has already begun. This fear of American competition in wheat has been a veritable sword of Damocles over the heads of the French agriculturalists in the North. Slowly but surely the day is approaching when they will be obliged either to turn their wheat fields into beet beds or to starve.

THE Board of Managers of the New York Produce Exchange adopted the following new rule regulating the flour trade, March 3. The same will be in force after it has been posted ten days: "When flour is sold to arrive within a specified time, lighterage free, tender as to time shall be given on notice from seller to buyer of arrival at railroad terminus or transportation line dock in the port of New York; when sold to arrive within specified time, delivered alongside vessel or free on board, in the absence of special agreement, the buyer shall furnish a place for delivery within twenty-four hours from notice from the seller of arrival, and tender as to time shall be arrival alongside. When flour is purchased lighterage free or free on board, the buyer shall have twenty-four hours from the day of sale or notice of arrival to examine as to its quality.

Wm. E. Catlin & Co., C. O. D. Mill Furnishers,

No. 63 Lake St, CHICAGO, ILL.



Catlin's Octagon Bucket.

BEST MILL BUCKET IN THE WORLD.

The ends of these buckets are fastened by a double fold. The bands double lap the ends, leaving the front of the bucket smooth. If you have not used them, please give them a trial.

| TIN. | | IRON. | |
|---------------|---------|---------------|----------|
| 2 1/2 x 2 1/2 | 5 Cents | 4 x 3 | 8 Cents |
| 3 x 2 1/2 | 5 1/2 " | 4 x 3 1/2 | 9 " |
| 3 x 3 | 6 " | 4 1/2 x 3 1/2 | 10 " |
| 3 1/2 x 3 | 7 " | 5 x 3 1/2 | 11 Cents |
| | | 5 x 4 | 12 " |
| | | 5 1/2 x 4 | 13 " |
| | | 6 x 4 | 14 " |
| | | 6 x 4 1/2 | 15 Cents |
| | | 7 x 4 1/2 | 16 " |
| | | 8 x 5 | 18 " |
| | | 9 x 5 | 20 " |

SPECIAL FIGURES ON LARGE QUANTITIES. SAMPLES FREE.

Odd sizes made to order. A large stock of "Octagon" Mill Buckets always on hand.

UNSOLICITED TESTIMONIALS.

I received my "Octagon" cups to-day. Am well pleased. J. M. BURKHOLDER, Casstown Mills, O.

The "Octagon" buckets you sent us have just arrived. We are fully pleased. They are strong and durable—the very kind we want—and at one-third the cost of as good an article here. JAS. CAMP, Fort Jones, Cal.

Your "Octagon" cups meet the approbation of all millers. They have been paying double your price for an inferior article. Wm. A. McMULLEN, Traveling Salesman.

We have been buying our buckets of—but we like the looks of your "Octagon." Please send us the following—HARDESTY BROS., Canal Dover, O.

The "Octagon" buckets came to hand and look equal to sample sent us before ordering. UNION MILLS FLOURING CO., Van Wert, O.

Please find enclosed draft for the "Octagon" buckets ordered on the 16th inst. They do their work nicely, and we are well pleased with them. STRAUS, ELSTON CO., Marietta, O.

"Octagon" buckets ordered the 14th and billed the 18th, just received. We are well pleased with them and will order another supply ere long. MITCHELL & BROWN, South Toledo, O.

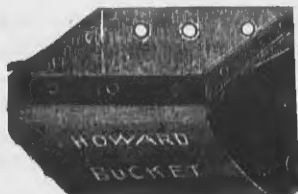
We received your "Octagon" elevator bucket, and like it very well. Send us—MOON & BLACK, Diana, Ill.

We like the form of your "Octagon" cups better than any other, so does our miller. J. SHOUTZ & SON, Bloomville, O.

We received your "Octagon" which we think is a real good cup. Please send us the following—H. J. SOMMER & BRO., Canton, O.

Enclosed find draft—for "Octagon" cups ordered last week. They are all right. T. W. STANTON & SON, Waupun, Wis.

We got some "Octagon" buckets of you last year, and now we want some more. Please ship us as follows—HOOD & BRADLEY, Belmont, N. Y.



Catlin's Howard Bucket.

This bucket is made entirely of one piece of metal. It is octagon shape, very smooth, neat and extra strong. They are acknowledged to be the most perfect warehouse bucket made.

I received the "Howard" bucket from your firm. I like the shape and manufacture of them first rate. When I built I had my buckets made to order, but they were much inferior to yours and cost more money. H. W. HOAG, Delevan Steam Grain Elevator, Delevan, Wis.

Quite a number of parties to whom we have furnished plans for elevators, are using the "Howard" bucket: they are well liked. CHASE ELEVATOR CO., Chicago, Ill.

We also manufacture to order four other styles of Elevator Buckets, and can make it to your interest to correspond with us when wanting buckets for any purpose.

MILL PICKS.

60 cents per lb.....Discount.....per ct.

WOOD CONVEYOR FLIGHTS.

75 cents per 100.....Discount.....per ct.

ELEVATOR BOLTS.

85 cents per 100.....Discount.....per ct.

Order from this advertisement, and if the goods and prices are not satisfactory they can be returned at our expense.

WM. E. CATLIN & CO.

Please mention the U. S. Miller when you write us.

63 Lake St., Chicago, Ill.

"THE GREAT ROCK ISLAND ROUTE"

Calls your attention to the following REASONS WHY, if about to make a Journey to the GREAT WEST, you should travel over it:

As nearly absolute safety as is possible to be attained. Sure connections in UNION DEPOTS, at all important points. No change of cars between CHICAGO, KANSAS CITY, LEAVENWORTH, ATCHISON or COUNCIL BLUFFS. Quick journeys because carried on Fast Express Trains. Day cars that are not only artistically decorated, but furnished with seats that admit of ease and comfort. Sleeping cars that permit quiet rest in home-like beds. Dining cars that are used only for eating purposes, and in which the best of meals are served for the reasonable sum of seventy-five cents each. A journey that furnishes the finest views of the fertile farms and pretty cities of Illinois, Iowa and Missouri, and is afterwards remembered as one of the pleasant incidents of life. You arrive at destination rested, not weary; clean, not dirty; calm, not angry. In brief, you get the maximum of comfort at a minimum of cost.



That the unremitting care of the Chicago, Rock Island & Pacific Railway for the comfort of its patrons is appreciated, is attested by its constantly increasing business, and the fact that it is the favorite route with delegates and visitors to the great assemblies, political, religious, educational and benevolent, that assemble from time to time in the great cities of the United States, as well as tourists who seek the pleasantest lines of travel while en route to behold the wonderful scenes of Colorado, the Yellowstone and Yosemite. To accommodate those who desire to visit Colorado for health, pleasure or business, in the most auspicious time of the year, the summer season and months of September and October, the Company every year puts on sale, May 1st, at all coupon ticket offices in the United States and Canada, round trip tickets to

DENVER, COLORADO SPRINGS and PUEBLO.

At reduced rates, good returning, until October 31st. Also to San Francisco, for parties of ten or more, good for ninety days, at great reduction from regular fares.

REMEMBER, this is the most direct route for all points WEST and SOUTHWEST. For further information, time-tables, maps or folders, call upon or address

R. R. CABLE,

Vice-President and Gen'l Mgr., Chicago.

E. ST. JOHN;

Gen'l Ticket and Pass Agent, Chicago.

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READ THIS!

Note, We Offer

Double Capacity.
Half Price.
Best Results.

Note This

Our Machine is Double.
We Put Two Purifiers in the Space of One.

Send for Circulars and Low Price List to

THE Purifier is capable of losing or saving the miller more than any machine in the mill. A poor one is a bad investment at any price. A good one is indispensable to modern milling. The CASE PURIFIER gives about double the capacity at about half the price of any on the market. These statements guaranteed. We can make the whitest middlings with the least waste of any machine now made.



Nickle FLOUR TESTERS mailed for 25c.

Mill For Sale—A Rare Bargain.

Desiring to turn my full attention to other business I offer for sale my Mill Property in Ripon, Wis. The mill is 40x60 and four stories high with additions 44x44 and 20x40, and cooper shop. Power: 13 feet head, 3 13-inch turbines, also 75 horse power engine with two boilers. Has 2 wheat stones, one middlings and a feed run, 2 purifiers, flour packer, separator, smutter, corn sheller, etc. Handsome dwelling house can be had with the mill. It has all conveniences and modern improvements. Good schools and college in the city. Any one desiring to go into the milling business, should not fail to examine this property. When you write me please mention the United States Miller. Address: H. B. BATEMAN, Ripon, Wis.

2 RUNS OF FIRST-CASS

MILL-STONES

FOR SALE.

For wheat grinding. In perfect order with spindle, tram-pot, fulcrum, curb, lighter screw and silent feeder. Will sell one or both runs at a very low price, delivered on board cars in Janesville. Address at once.

NOTBOHM BROS.

JANESVILLE, WIS.

Mention this paper when you write us.

C. C. PHILLIPS,

MANUFACTURER OF

VERTICAL and HORIZONTAL

French Burr Mills.

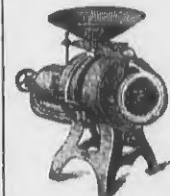
GREATLY IMPROVED.

Adapted to all kinds of Grinding.

Send for circular before purchasing elsewhere.

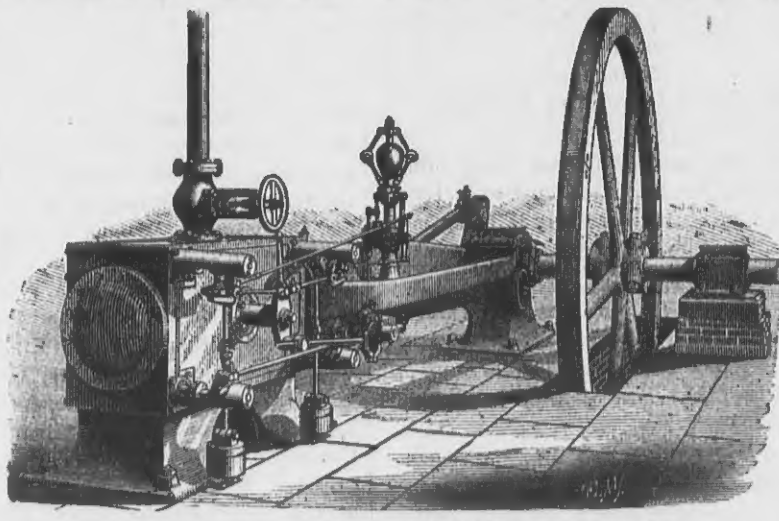
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PHILADELPHIA, PA.



ATLAS-CORLISS ENGINE

Will Replace Ordinary Engines, Guaranteeing to Save One-Third Fuel.



Write for ENGINE PAMPHLET.

ATLAS ENGINE WORKS, INDIANAPOLIS, INDIANA.

BUILDERS OF ALL CLASSES OF

Engines and Boilers.

We build The Best Farm Engines and Small Engines for Warehouses and Elevators.

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Porcelain Rollers!!

THE INVENTOR AND MANUFACTURER.

WILHELM BRAUN,

ENGINEER,

Carlsbad, - Bohemia,

Offers the BEST and HARDEST in existence,

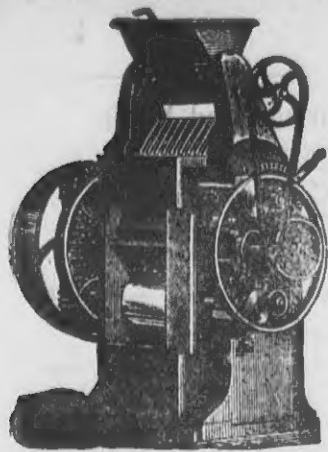
of all sizes, in a rough state, mechanically

fitted on their shafts, and ground ready

to be laid in the Roller Mills.

VIENNA EXHIBITION. 1873, Awarded Diploma of Honor.

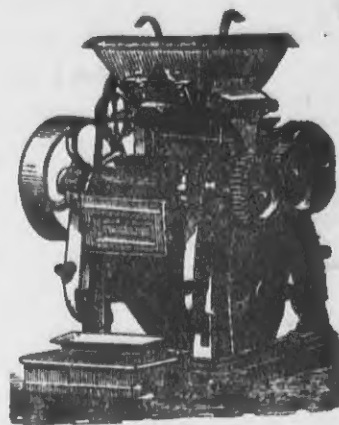
PARIS EXHIBITION, 1878, Awarded 2 Gold Medals and 1 Silver Medal.



GANZ & CO.,

Iron Foundry and Manufacturing Association,

Buda-Pesth, Hungary; or Ratibor, Germany.



We take this method of recommending to the American milling public our PATENT ROLLER MILLS with chilled cast iron rollers, for crushing and grinding wheat, which have met with such eminent success in Europe. The mill-owners of BUDA-PESTH, as well as the prominent millers of Austro-Hungary, and a large number in Southern Germany, Switzerland and England, have provided for their mills the celebrated GANZ ROLLER MILLS, which are about to supplant entirely grinding on mill-stones, their working being more perfect, producing more white flour, requiring less power than the best mill-stone, and wanting no repairs excepting to occasionally replace a bearing. We have introduced into the art of milling these Roller Mills with chilled cast iron rollers, and from 1874 to January, 1879, we have delivered in the different European countries, Africa and the United States of America about 2,100 mills, and all work satisfactorily. Our crushing mills may now be regarded as absolutely necessary for every well-furnished modern mill, and this is proven by the numerous testimonials at hand. Our grinding mills are remarkable for their absolute discharge bearings, by means of the newly-devised Anti-Friction Pressure Rings. These Rings allow a very high pressure, and hence assure the performance of a great deal of work, avoiding all waste of power caused in other machines by friction in the bearings.

Out of numerous testimonials at hand we select the following:

BUDA-PESTH, March 28, 1879.—To Messrs. Ganz & Co., Foundry and Engineering Co., Limited, Buda-Pesth: Complying with your request to communicate to you my experience with your Roller material, I have pleasure in stating that I consider it, i. e., your generally well-famed chilled iron, as the best within my experience, and its adoption has satisfied me in every respect, so that I do not hesitate to assert, by introducing it on a large scale, you have rendered a considerable service to the milling art. Your material is equally well adapted for rough grinding, softening or grinding. Owing to its great hardness I cannot characterize it otherwise than indestructible. The grooved cracking rollers have demonstrated this hardness, as also a toughness, of your castings in a manner which astonishes all who know the rapid wear of cutting edges used in the treatment of grain. Your smooth rollers, once properly ground, preserve their complete cylindrical form, and do not require any repairs for a period which even now cannot be estimated. They acquire, soon after being put to work, a finely-gritted surface texture, eminently adapted for grinding as well as for drawing down the meal, a condition which they preserve without change. It is quite superfluous to prove that there can be absolutely no question of discoloring unless with reference to new rollers, to which some remnants of oil, emery or other matter may yet adhere. The flour produced by your Chilled-Iron Rollers is very lively and has remarkable baking qualities. While stating the above to the best of my conviction in answer to your inquiry, I seize with pleasure this opportunity to express to you my thorough approbation, not only of your roller material, but also generally of your roller mill construction. Your rough grinding (cracking) with chilled-iron roller mills constitutes such an essential step in advance as compared to the rough grinding with stones, that they cannot fail to win their way into every well-built mill, working on the high or half-high grinding system. For the purposes of reduction to flour you have lately erected a form of mill which I consider extraordinarily successful. You have by the introduction of an entirely new mechanical organ, i. e., the Rotary Anti-Friction Spring Pressure Ring, solved the problem of discharged bearings, which has so often been raised and as often dropped again unanswered. You have achieved success with decided aptitude in a manner as wonderful as it is simple and practical. This Roller Mill absorbs, in fact, only just the power required for the reduction into flour, and none for bearing friction which, usually, as is well known, amounts to a high figure. This Flour Mill receives an agreeable and light form while attaining a capacity hitherto unknown. In handing you the above communication for use as you may deem desirable, I remain, etc.,

(Signed) C. HAGENMACHER, Director of the First Ofen-Pesth Steam Mills.

TIVOLI KUNSTMUEHLE, Munich, April 5, 1878.—To Messrs. Ganz & Co., Engineers, Buda-Pesth—Dear Sirs: In reply to your esteemed of March 28, we have pleasure in testifying to our satisfaction with the Chilled-Iron Rollers

Address all communications to

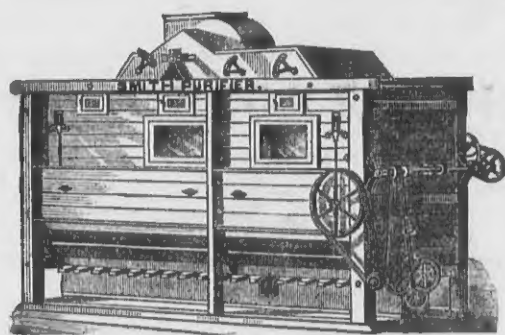
GANZ & CO., Buda-Pesth, Hungary.

Cable Address "GANZ, Kaiserbad."

Or GANZ & CO., Ratibor, Germany.

Or THROOP GRAIN CLEANER CO., Auburn, New York.

[Mention this paper when you write us.]



SIMPLE, DURABLE, ECONOMICAL. Cheaper than any other of equal capacity. Licensed under all patents owned by Consolidated Middlings Purifier Co. Eight sizes single and three sizes double machines.

THE GEO. T. SMITH MIDLINGS PURIFIER

Was awarded THE HIGHEST PRIZE ever offered for the competition of milling machinery—THE LOCKWOOD MEDAL—at the great Exposition. Competition and comparison with every other known Purifier only established it more firmly in the esteem and approval of millers and mill-owners.

It was UNANIMOUSLY awarded the FIRST PREMIUM in its class by a jury of five of the ablest, most successful and experienced mill-owners in the United States, men who represented the milling of every variety of wheat, and the use of all the latest and most approved methods of new process and gradual reduction milling.

Our sales during the Exposition aggregated OVER ONE HUNDRED MACHINES, for every part of the country and for work on all kinds of stock.

We invite particular attention to our SPECIAL machines, combining in one all the features of both air and sieve Purifiers, perfectly adapted to handle and purify the breaks of roller mills.

Write for descriptive circular and price list to the

GEO. T. SMITH MIDLINGS PURIFIER CO., Jackson, Mich.

[Mention this paper when you write us.]

HENRY SMITH, JR.

GEO. G. SMITH.

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SMITH BROTHERS, Practical Millwrights.

Plans, Specifications and Estimates made for all kinds of

MILLWORK, MACHINERY, Etc., Etc.

Flour, Sawmill, Tanners' and Brewers' Machinery, and General Mill Furnishers.

No. 454 Canal Street,

MILWAUKEE WIS.

[Mention this paper when you write us.]



"The Lockwood Medal," Awarded to the Geo. T. Smith Middlings Purifier, as the machine marking greatest progress and utility in its application to the grain and milling interests, invented within the last ten years.

Miller's International Exhibition, Cincinnati, Ohio, 1880.

1865.

1881.

C. A. FOLSOM & SON,

Manufacturers of the Purest and Best

Lubricating and Burning Oils

GREASES, ETC.

For Flour Mill Machinery, SPECIALTIES,

MILLERS' CASTOR Machinery Oil.

A compound oil, warranted better than Lard or Spem Oil for machinery uses, and will last longer. Guaranteed not to heat or gum, and to give satisfaction when used on steps, spindles, etc.

MILLERS' LAMP OIL.

Warranted free from Petroleum. Burns equal to Lard or Spem Oil. Will not chill at 32° above zero, and much cheaper than Lard Oil.

GLOBE A, Natural W. Virginia Rock Oil.

A perfectly natural oil, just as it comes from the earth. Thoroughly settled and refined of high fire test, and will not congeal at zero. It is the best Black Oil produced.

Peerless Mill Doap.

A compound grease for use on cogs and all heavy gearing. Put up in kegs, half barrels and barrels.

CAPITOL CYLINDER OIL.

Manufactured for Steam Cylinders, especially for use in Patent Lubricators. Warranted not to foam, heat or gum, and endorsed by manufacturers of Corliss Engines. We also have all grades of Spem and Golden Machinery, Lard, Engine, and several grades of Cylinder and Black Oils, Plumbago, Cotton Waste, etc., etc., which we will offer at prices that defy competition, when quality is considered. Orders and correspondence solicited.

C.A. FOLSOM & SON,

130 WEST WATER STREET, MILWAUKEE, WIS.

Mention this paper when you write us.

All parties who desire to obtain

EUROPEAN PATENTS

Will do well to consult the undersigned, who is a thorough milling expert as well as

Solicitor of Patents.

Unquestionable references furnished in Europe or America on application. Address all communications to

P. SCHNEITLER,

april Berlin N., Muellerstrasse 179 B., Germany.

N.B.—I respectfully ask that manufacturers of American milling machinery and agricultural machinery will favor me with their catalogues. Address as above.

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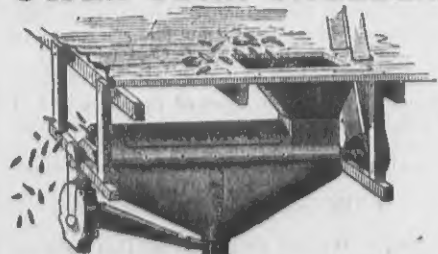
SITUATION WANTED.

By a practical miller as head miller, or would rent or run a good custom mill. Address

LEAD MILLER,

Care of the United States Miller, Milwaukee, Wis.

TRIUMPH POWER CORN SHELDER!



Shells and Cleans 2,000 Bushels Ears per day. The Cheapest, Best and most Simple Power Corn Sheller in use. Send for Circular and Price List.

MILBERT & FAIG,

Painesville, Ohio.

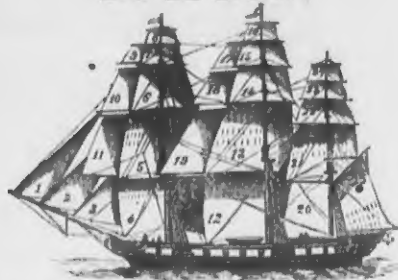
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FOR SALE.

A Flouring Mill of the latest improved gradual reduction roller system, together with 30 acres of good land, good house and barn, located on the Iowa River, 8 miles northeast of Cresco, at Kendallville. The property must be sold, and a great bargain will be given. Death of my husband, S. S. Kendall, is the reason for offering the above property for sale. For further particulars address
MRS. S. S. KENDALL, Administratrix,
 Kendallville P. O., Winnebago Co., Iowa.

WEBSTER'S UNABRIDGED.

If you intend sometime to get a copy of Webster's Unabridged Dictionary,
"DO IT NOW."



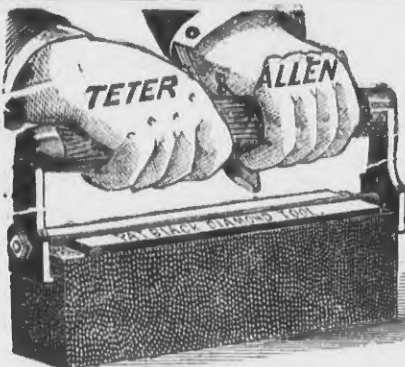
See Webster's Unabridged, page 1164, giving the name of each sail, showing the value of **DEFINITIONS BY ILLUSTRATIONS.**

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New Edition of WEBSTER, has 4600 NEW WORDS and Meanings, Biographical Dictionary of over 9700 Names.

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Over 4000 now in use. Guaranteed the best Tool in the market for smoothing the face and furrows, removing glaze, and restoring the burrs to their sharp, natural grit. It is far superior to Emery or Corundum. Used with or without water. Too large to send by mail. Price, \$5.50. Will send our Tool on trial against any other in the market, Miller's to pay for the best after a trial. Sold by Mill Furnishers throughout the world.

See that it has "Teter & Allen, Pat. Black Diamond Tool" on the plate.

TETER & ALLEN,
 404 Commerce St., Philadelphia, Pa.

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STEEL CASTINGS

FROM 1-4 TO 10,000 LBS. WEIGHT.
 True to pattern, sound and solid, of unequalled strength, toughness and durability.
 An invaluable substitute for forgings or cast iron requiring three-fold strength.
 Gearing of all kinds, Shafts, Dies, Hammer-Heads, Cross-Heads for Locomotives, etc.
 15,000 Crank Shafts and 10,000 Gear Wheels of this steel now running prove its superiority over all other steel castings.
CRANK SHAFTS, CROSS-HEADS and GEARING specialties.
 Circulars and price lists free. Address

CHESTER STEEL CASTINGS CO.,
 Works, CHESTER, PA. 407 Library St., PHILADELPHIA.

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BOTTLED BEER.

VOECHTING, SHAPE & CO.,

SOLE BOTTLEERS OF

Joseph Schlitz Brewing Company's Celebrated Milwaukee Lager Beer

Cor. Second and Calena Streets,

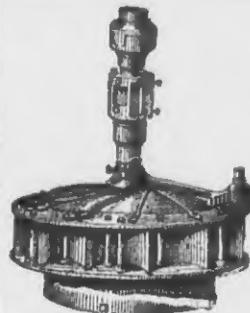
MILWAUKEE

WISCONSIN.

BOTTLEERS' SUPPLIES CONSTANTLY ON HAND

Parties corresponding will please state where they saw this advertisement.

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**James Leffel's Improved WATER WHEEL.**

PRICES GREATLY REDUCED FOR 1879.

The "OLD RELIABLE" with Improvements, making it the **Most Perfect Turbine now in Use**, comprising the **Largest** and the **Smallest Wheels**, under both the **Highest** and **Lowest** Heads used in this country. Our New Book for 1879 sent free to those using Water Power. Address

JAMES LEFFEL & CO., Springfield, Ohio,
 and 109 Liberty Street, N. Y. City.

Mar 21

[Mention this paper when you write us.]

Stout, Mills & Temple, DAYTON, OHIO,

MANUFACTURERS OF THE

AMERICAN TURBINE WATER WHEEL,

Best Quality French Burr Millstones.

Sole Agents in Dayton for the sale of

DU FOUR & CO.'S CELEBRATED BOLTING CLOTHS.

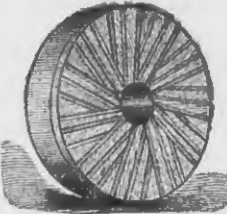
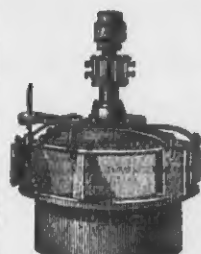
Flour and Paper Mill Machinery, Best Chilled or Porcelain Rolls for Crushing Wheat or Middlings,

AND GENERAL MILL FURNISHINGS.

The **AMERICAN TURBINE**, as recently improved, is unequalled in the power utilized from a given quantity of water, and is decidedly the **BEST PATENT Water Wheel** ever known. It has also been otherwise greatly improved.

Large Illustrated Catalogue Sent Free on Application.

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**A Hungarian Head Miller.**

Having for many years had experience as head miller in Buda-Pesth, Hungary, desires to open correspondence with some American milling firm, with a view to locating in America. Address all letters as below, and they will be duly forwarded to me. Please state what wages could be expected in case entire satisfaction is given.

HUNGARIAN MILLER,

Care of United States Miller. Milwaukee, Wis.

Mill Property For Sale.

Flour Mill, Saw Mill, Planer and Circular Saw Mills, located on bank of Ohio River, 400 feet from depot of C. & P. R. R., 35 miles below Pittsburgh, Pa., in a good business location and grain growing neighborhood. Good shipping facilities by river and rail. Mills, engine and all machinery in good running order. Will be sold low for cash or exchange for farm. Also large commodious dwelling house. Address **J. W. ENGLE,** Industry, Beaver Co., Pa.

For Sale—A Rare Bargain.

Desiring to turn my full attention to farming, I offer for sale my mill property. The Mill is 40x50 and 3 stories high. Power, 11 feet head. It has one set of wheat buhrs, and one of corn, all in good order, also a first-class cotton gin and 80 acres of land well improved, a good two story dwelling, cost \$700 to build. This property is situated on Elk River. I can grind 280 bushels at the lowest tide of water. I would sell for half cash, the balance on time. For further particulars come and see the property or address the undersigned.

J. FORESTER,
 Estell Springs, Franklin Co., Tenn.

SUBSCRIBE FOR THE

United States Miller!

THE LEADING MILLING JOURNAL OF AMERICA

Subscription Price One Dollar per year, post paid. Address **UNITED STATES MILLER,**

62 Grand Opera House, Milwaukee, Wis.

JOHN C. HIGGINS,

Manufacturer and Dresser of

Mill Picks,

No. 167 W. Kinzie Street,

CHICAGO, ILLINOIS.

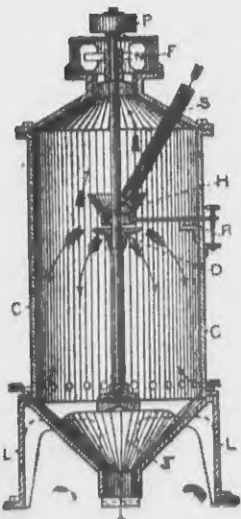


Picks will be sent on 30 or 60 days' trial to any responsible miller in the United States or Canada, and if not superior in every respect to any other pick made in this or any other country, there will be no charge, and I will pay all express charges to and from Chicago. All my picks are made of a special steel, which is manufactured expressly for me at Sheffield, England. My customers can thus be assured of a good article, and share with me the profits of direct importation. References furnished from every State and Territory in the United States and Canada. Send for Circular and Price List.

[Mention this paper when you write us.]

NEW MILLING PROCESS.

DO NOT THROW ASIDE THE MILL-STONES UNTIL YOU HAVE INVESTIGATED THIS IMPORTANT INVENTION.



We have discovered and perfected a **New Process** by which, by the aid of our machine—light running, durable, requiring little power and space—we can successfully purify the meal of ground or crushed wheat, thereby bringing the **straight flour**, or first bolting (without waste) to the highest standard of excellence. By the use of our process and machinery we extract from the meal of ground or crushed wheat, all the low grades, the dead or overground flocculent material (which exists in all meal, however well prepared) before bolting, leaving nothing in the chop but the best quality of flour for the bolts to operate on and separate.

THE ADVANTAGES obtained by these machines are as follows:

1. They thoroughly eliminate all low grades or coloring material before bolting, thus enhancing the value of the straight flour, both in strength and color.
2. No clogging of cloths, freer bolting, and, consequently, more granular flour.
3. Middlings purifiers greatly assisted, as a large percentage of specular and fine offal is deposited in fan-room by the machine.
4. A better low grade flour, without consuming power by regrinding.

Our process and machinery are fully covered by letters patent. Will ship the Machine to any responsible party on thirty days' trial, and, if the results are not perfectly satisfactory, the same can be returned to us or held subject to our order.

TESTIMONIALS.

The following testimonials speak for themselves. We have others, but think the following sufficient as they show that both spring and winter wheat regions will be greatly benefitted by the use of our machinery and process:

MINNEAPOLIS, Minn., March 15, 1881.—Wheat Meal Purifier Co., Minneapolis—Gentlemen: This is to certify that we have lately tested the merits of the Wheat Meal Purifier, and find the results so satisfactory that we have adopted them. Respectfully yours,
COLBURN & CHRISTIAN,
 Eagle Mills.

Wheat Meal Purifier Co., Georgetown, D. C.—Gentlemen: In reply to yours of February 2nd, I have the pleasure to inform you that your Wheat Meal Purifier has been in constant use in my mill for the past four months, and am now prepared to advise you that it gives entire satisfaction. By extracting the impurities from the chop before bolting it, we find the flour greatly enhanced in value and much more saleable at better prices. Yours truly,
D. G. WATKINS CO.,
 Old Dominion Mills, Alexandria, Va.

Wheat Meal Purifier Co., Georgetown, D. C.—Gentlemen: We are pleased to say that we have been using in our mill at this place two of your Wheat Meal Purifiers for the last eight months, and have fully realized all you represented to us in regard to them. They thoroughly remove all the light, fine impurities from the meal before going to the bolts, and the result is a vast improvement in our flour. Consequently, we would not think of running our mill a day without the Wheat Meal Purifier. Respectfully yours,
NALLS & CO. Alexandria, Va.

ALEXANDRIA, Va., Jan. 3, 1880.—Wheat Meal Purifier Co., Georgetown, D. C.—Gentlemen: This certifies that I have been Inspector of Flour of this place for the past eight years, and having fully examined the operation and merits of your Wheat Meal Purifier I am prepared to add my endorsement of its very superior work. The difference in the flour when treated by your machine is fully fifty cents per barrel and more, according to percentage of light coloring matter extracted from the wheat chop before it goes to the bolts. The material taken out passes for a good article of super, and in my judgment has no business in the chop going to the fancy flour bolts. Very respectfully,
JNO. W. TAYLOR,
 Flour Inspector, Alexandria.

Wheat Meal Purifier Co., Georgetown, D. C.—To whom it may concern: This is to certify that I have carefully examined the operation of your Wheat Meal Purifiers in Nalls & Co.'s mill, in Alexandria, Va., and am free to acknowledge their great utility. As Flour Inspector of Washington City, D. C., I can safely pronounce their flour worth fully fifty cents per barrel more than it was formerly. This improvement is the result of the chop being purified before it is bolted, and the material so extracted is a fair saleable "super" flour. I would recommend the use of the Wheat Meal Purifier to all millers desiring to raise the quality of their work.
B. F. CRABBS, Flour Inspector,
 Washington City, D. C.

Address all communications to

WHEAT MEAL PURIFIER CO.,

Minneapolis, Minn., or Georgetown, D. C.

Please mention this paper when you write us.